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TABLE OF CONTENTS

[Intervention Review]

Psychological therapies for people with borderline personality disorder

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ABSTRACT

Background

Over the decades, a variety of psychological interventions for borderline personality disorder (BPD) have been developed. This review updates and replaces an earlier review (Stoffers-Winterling 2012).

Objectives

To assess the beneficial and harmful effects of psychological therapies for people with BPD.

Search methods

In March 2019, we searched CENTRAL, MEDLINE, Embase, 14 other databases and four trials registers. We contacted researchers working in the field to ask for additional data from published and unpublished trials, and handsearched relevant journals. We did not restrict the search by year of publication, language or type of publication.

Selection criteria

Randomised controlled trials comparing different psychotherapeutic interventions with treatment-as-usual (TAU; which included various kinds of psychotherapy), waiting list, no treatment or active treatments in samples of all ages, in any setting, with a formal diagnosis of BPD. The primary outcomes were BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning. There were 11 secondary outcomes, including individual BPD symptoms, as well as attrition and adverse effects.

Data collection and analysis

At least two review authors independently selected trials, extracted data, assessed risk of bias using Cochrane's 'Risk of bias' tool and assessed the certainty of the evidence using the GRADE approach. We performed data analysis using Review Manager 5 and quantified the statistical reliability of the data using Trial Sequential Analysis.

Main results

We included 75 randomised controlled trials (4507 participants), predominantly involving females with mean ages ranging from 14.8 to 45.7 years. More than 16 different kinds of psychotherapy were included, mostly dialectical behaviour therapy (DBT) and mentalisation-based treatment (MBT). The comparator interventions included treatment-as-usual (TAU), waiting list, and other active treatments. Treatment duration ranged from one to 36 months.

Psychotherapy versus TAU

Psychotherapy reduced BPD symptom severity, compared to TAU; standardised mean difference (SMD) −0.52, 95% confidence interval (CI) −0.70 to −0.33; 22 trials, 1244 participants; moderate-quality evidence. This corresponds to a mean difference (MD) of −3.6 (95% CI −4.4 to −2.08) on the Zanarini Rating Scale for BPD (range 0 to 36), a clinically relevant reduction in BPD symptom severity (minimal clinical relevant difference (MIREDIF) on this scale is −3.0 points).

Psychotherapy may be more effective at reducing self-harm compared to TAU (SMD −0.32, 95% CI −0.49 to −0.14; 13 trials, 616 participants; low-quality evidence), corresponding to a MD of −0.82 (95% CI −1.25 to 0.35) on the Deliberate Self-Harm Inventory Scale (range 0 to 34). The MIREDIF of −1.25 points was not reached.

Suicide-related outcomes improved compared to TAU (SMD −0.34, 95% CI −0.57 to −0.11; 13 trials, 666 participants; low-quality evidence), corresponding to a MD of −0.11 (95% CI −0.19 to −0.034) on the Suicidal Attempt Self Injury Interview. The MIREDIF of −0.17 points was not reached.

Compared to TAU, psychotherapy may result in an improvement in psychosocial functioning (SMD −0.45, 95% CI −0.68 to −0.22; 22 trials, 1314 participants; low-quality evidence), corresponding to a MD of −2.8 (95% CI −4.25 to −1.38), on the Global Assessment of Functioning Scale (range 0 to 100). The MIREDIF of −4.0 points was not reached.

Our additional Trial Sequential Analysis on all primary outcomes reaching significance found that the required information size was reached in all cases.

A subgroup analysis comparing the different types of psychotherapy compared to TAU showed no clear evidence of a difference for BPD severity and psychosocial functioning.

Psychotherapy may reduce depressive symptoms compared to TAU but the evidence is very uncertain (SMD −0.39, 95% CI −0.61 to −0.17; 22 trials, 1568 participants; very low-quality evidence), corresponding to a MD of −2.45 points on the Hamilton Depression Scale (range 0 to 50). The MIREDIF of −3.0 points was not reached.

BPD-specific psychotherapy did not reduce attrition compared with TAU. Adverse effects were unclear due to too few data.

Psychotherapy versus waiting list or no treatment

Greater improvements in BPD symptom severity (SMD −0.49, 95% CI −0.93 to −0.05; 3 trials, 161 participants), psychosocial functioning (SMD −0.56, 95% CI −1.01 to −0.11; 5 trials, 219 participants), and depression (SMD −1.28, 95% CI −2.21 to −0.34, 6 trials, 239 participants) were observed in participants receiving psychotherapy versus waiting list or no treatment (all low-quality evidence). No evidence of a difference was found for self-harm and suicide-related outcomes.

Individual treatment approaches

DBT and MBT have the highest numbers of primary trials, with DBT as subject of one-third of all included trials, followed by MBT with seven RCTs.

Compared to TAU, DBT was more effective at reducing BPD severity (SMD −0.60, 95% CI −1.05 to −0.14; 3 trials, 149 participants), self-harm (SMD −0.28, 95% CI −0.48 to −0.07; 7 trials, 376 participants) and improving psychosocial functioning (SMD −0.36, 95% CI −0.69 to −0.03; 6 trials, 225 participants). MBT appears to be more effective than TAU at reducing self-harm (RR 0.62, 95% CI 0.49 to 0.80; 3 trials, 252 participants), suicidality (RR 0.10, 95% CI 0.04, 0.30, 3 trials, 218 participants) and depression (SMD −0.58, 95% CI −1.22 to 0.05, 4 trials, 333 participants). All findings are based on low-quality evidence. For secondary outcomes see review text.

Authors' conclusions

Our assessments showed beneficial effects on all primary outcomes in favour of BPD-tailored psychotherapy compared with TAU. However, only the outcome of BPD severity reached the MIREDIF-defined cut-off for a clinically meaningful improvement. Subgroup analyses found no evidence of a difference in effect estimates between the different types of therapies (compared to TAU) .

The pooled analysis of psychotherapy versus waiting list or no treatment found significant improvement on BPD severity, psychosocial functioning and depression at end of treatment, but these findings were based on low-quality evidence, and the true magnitude of these effects is uncertain. No clear evidence of difference was found for self-harm and suicide-related outcomes.

However, compared to TAU, we observed effects in favour of DBT for BPD severity, self-harm and psychosocial functioning and, for MBT, on self-harm and suicidality at end of treatment, but these were all based on low-quality evidence. Therefore, we are unsure whether these effects would alter with the addition of more data.

PLAIN LANGUAGE SUMMARY

Psychological therapies for people with borderline personality disorder

Background

People affected by borderline personality disorder (BPD) often have difficulties with controlling their impulses and emotions. They may have a poor self-image, experience rapid changes in mood, harm themselves and find it hard to engage in harmonious interpersonal relationships. Different types of psychological treatments ('talking treatments') have been developed to help people with BPD. The effects of these treatments must be investigated to decide how well they work and if they can be harmful.

Objective

This review summarises what we currently know about the effect of psychotherapy in people with BPD.

Methods

We compared the effects of psychological treatments on people affected by BPD who did not receive treatment or who continued their usual treatment, were on a waiting list or received active treatment.

Findings

We searched for relevant research articles, and found 75 trials (4507 participants, mostly female, mean age ranging from 14.8 to 45.7 years). The trials examined a wide variety of psychological treatments (over 16 different types). They were mostly conducted in outpatient settings, and lasted between one and 36 months. Dialectical behaviour Therapy (DBT) and Mentalisation-Based Treatment (MBT) were the therapies most studied.

Psychotherapy compared with usual treatment

Psychotherapy reduced the severity of BPD symptoms and suicidality and may reduce self-harm and depression whilst also improving psychological functioning compared to usual treatment. DBT may be better than usual treatment at reducing BPD severity, self-harm and improving psychosocial functioning. Similarly, MBT appears to be more effective than usual treatment at reducing self-harm, suicidality and depression. However, these findings were all based on low-quality evidence and therefore we are uncertain whether or not these results would change if we added more trials. Most trials did not report adverse effects, and those that did, found no obvious unwanted reactions following psychological treatment. The majority of trials (64 out of 75) were funded by grants from universities, authorities or research foundations. Four trials reported that no funding was received. For the remaining trials (7), funding was not specified.

Psychotherapy versus waiting list or no treatment

Psychotherapy was more effective than waiting list at improving BPD symptoms, psychosocial functioning, and depression, but there was no clear difference between psychotherapy, and waiting list for outcomes of self-harm, and suicide-related outcomes.

Conclusions

In general, psychotherapy may be more effective than usual treatment in reducing BPD symptom severity, self-harm, suicide-related outcomes and depression, whilst also improving psychosocial functioning. However, only the decrease in BPD symptom severity was found to be at a clinically important level. DBT appears to be better at reducing BPD severity, self-harm, and improving psychosocial functioning compared to usual treatment and MBT appears more effective than usual treatment at reducing self-harm and suicidality. However, we are still uncertain about these findings as the quality of the evidence is low.

SUMMARY OF FINDINGS

Summary of findings 1. Psychotherapy versus treatment-as-usual

Psychotherapy versus treatment-as-usual

Patient or population: borderline personality disorder

Settings: inpatient and outpatient

Intervention: psychotherapy

Comparison: treatment-as-usual (TAU)

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect(95% CI)	Number of participants (RCTs)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	TAU	Psychotherapy				
BPD symptom severity Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.52 SD lower** (0.70 lower to 0.33 lower)	-	1244 (22 RCTs)	⊕⊕⊕⊖ **Moderate**[a]	The SMD of −0.52 corresponds to −3.6 on the Zanarini BPD scale. The MIREDIF on this scale is 3.0 points TSA adjusted CI = −5.49 to −1.90 on the Zanarini BPD scale TSA RIS = 901
Self-harm (frequency) Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.32 SD lower** (0.49 lower to 0.14 lower)	-	616 (13 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	The SMD of −0. 32 corresponds to −0.82 on the DSHI. The MIREDIF on this scale is −1.25 points (½ SD) TSA adjusted CI = −0.59 to −0.08 on the DSHI TSA RIS = 97
Suicide-related outcomes (suicidality) Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.34 SD lower** (0.57 lower to 0.11 lower)	-	666 (13 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	The SMD of −0. 34 corresponds to −0.11 on the SASII. The MIREDIF on this scale is −0.17 points (½ SD) TSA adjusted CI = −0.18 to −0.04 on the SASII TSA RIS = 253

Psychosocial functioning Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.45 SD lower** (0.68 lower to 0.22 lower)	-	1314 (22 RCTs)	⊕⊕⊖⊖ **Low**[a,c]	The SMD of −0.45 corresponds to −2.8 on the GAF. The MIREDIF on this scale is −4.0 points TSA adjusted CI = −3.97 to −1.94 on the GAF TSA RIS = 947
Depression Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.39 SD lower** (0.61 lower to 0.17 lower)	-	1568 (22 RCTs)	⊕⊖⊖⊖ **Very low**[a,b,c]	The SMD of -0.45 corresponds to −2.45 on the Hamilton Depression Scale. The MIREDIF on this scale is 3.0 points TSA adjusted CI = −3.34 to −1.72 on the Hamilton Depression Scale TSA RIS = 2274
Attrition Timing of outcome assessment: end of treatment	**328 per 1000**	**328 per 1000** (95% CI 56 fewer to 66 higher)	**RR 1.00 (95% CI 0.83 to 1.20)**	2225 (32 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	-
Adverse effects Timing of outcome assessment: end of treatment	**74 per 1000**	**6 per 1000** (95% CI 41 fewer to 65 higher)	**RR 0.92 (95% CI 0.45 to 1.88)**	381 (2 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	-

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **DSHI:** Deliberate Self-Harm Inventory; **GAF:** Global Assessment of Functioning scale; **MIREDIF:** Minimum relevant difference; **RCTs:** Randomised controlled trials; **RIS:** Required information size; **RR:** Risk Ratio; **SASII:** Suicide Attempt Self-Injury Interview; **SD:** Standard deviation; **SMD:** Standardised mean difference; **TAU:** treatment-as-usual; **TSA:** Trial Sequential Analysis

GRADE Working Group grades of evidence
High quality: further research is very unlikely to change our confidence in the estimate of effect
Moderate quality: further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
Low quality: further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
Very low quality: we are very uncertain about the estimate

[a]We downgraded the quality of this evidence by one level due to risk of bias (other bias).
[b]We downgraded the quality of this evidence by one level due to imprecision.
[c]We downgraded the quality of this evidence by one level due to high heterogeneity.

Summary of findings 2. Psychotherapy versus waiting list or no treatment

Psychotherapy versus waiting list or no treatment

Patient or population: borderline personality disorder

Settings: inpatient and outpatient

Intervention: psychotherapy

Comparison: waiting list or no treatment

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	Number of participants (RCTs)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	Waiting list or no treatment	Psychotherapy				
BPD symptom severity Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.49 SD lower** (0.93 lower to 0.05 lower)	-	161 (3 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	An SMD of 0.49 represents a moderate effect.
Self-harm Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was**0.17 SD lower** (0.52 lower to 0.18 higher)	-	128 (2 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	An SMD of 0.17 represents a small effect.
Suicide-related outcomes Measured by: self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **5.62 SD lower** (16.39 lower to 5.16 higher)	-	108 (2 RCTs)	⊕⊖⊖⊖ **Very low**[a,b,c]	An SMD of 5.62 represents a large effect.
Psychosocial functioning Measured by: clinicians and self-rated	-	The mean score in the intervention groups was **0.56 SD lower** (1.01 lower to 0.11 lower)	-	219 (5 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	An SMD of 0.56 represents a moderate effect.

Timing of outcome assessment: end of treatment						
Depression Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **1.28 SD lower** (2.21 lower to 0.34 lower)	-	239 (6 RCTs)	⊕⊕⊖⊖ **Low[a,b]**	An effect size of 1.28 represents a large effect.
Attrition Timing of outcome assessment: end of treatment	**81 per 1000**	**147 per 1000** (95% CI 118 fewer to 74 higher)	**RR 0.55 (95% CI 0.20 to 1.50)**	144 (3 RCTs)	⊕⊖⊖⊖ **Very low[a,b,c]**	-
Adverse effects (not measured	See comments	See comments	-	-	-	No studies were found that assessed this outcome

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **RCTs:** Randomised controlled trials; **RR:** Risk ratio; **SMD:** Standardized mean difference

GRADE Working Group grades of evidence
High quality: further research is very unlikely to change our confidence in the estimate of effect
Moderate quality: further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
Low quality: further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
Very low quality: we are very uncertain about the estimate

[a]We downgraded the quality of this evidence by one level due to risk of bias.
[b]We downgraded the quality of this evidence by one level due to imprecision (there was a wide CI).
[c]We downgraded the quality of this evidence by one level due to inconsistency.

Summary of findings 3. Dialectical behavioural therapy or mentalisation-based therapy versus treatment-as-usual

Dialectical behavioural therapy or mentalisation-based therapy versus treatment-as-usual
Patient or population: borderline personality disorder
Settings: inpatient and outpatient
Intervention: dialectical behavioural therapy (DBT) or mentalisation-based therapy (MBT)

Comparison: treatment-as-usual (TAU)

Outcomes	Illustrative comparative risks* (95% CI)		Relative effect (95% CI)	Number of participants (RCTs)	Quality of the evidence (GRADE)	Comments
	Assumed risk	Corresponding risk				
	TAU	DBT or MBT				
DBT						
BPD severity Measured by: clinicians Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.60 SD lower** (1.05 lower to 0.14 lower)	-	149 (3 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	An SMD of 0.60 represents a moderate effect.
Self-harm Measured by: clinicians Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.28 SD lower** (0.48 lower to 0.07 lower)	-	376 (7 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	An SMD of 0.28 represents a small effect.
Psychosocial functioning Measured by: clinicians and self-rated Timing of outcome assessment: end of treatment	-	The mean score in the intervention groups was **0.36 SD lower** (0.69 lower to 0.03 lower)	-	225 (6 RCTs)	⊕⊕⊖⊖ **Low**[a,b,]	An SMD of 0.36 represents a small effect.
MBT						
Self-harm Measured by: clinicians Timing of outcome assessment: end of treatment	**631 per 1000**	**240 per 1000** (95% CI 334 fewer to 126 fewer)	**RR 0.62 (95% CI 0.49 to 0.80)**	252 (3 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	-
Suicide-related outcomes Measured by: clinicians Timing of outcome assessment: end of treatment	**298 per 1000**	**268 per 1000** (95% CI 286 fewer to 209 fewer)	**RR 0.10 (95% CI 0.04 to 0.30)**	218 (3 RCTs)	⊕⊕⊖⊖ **Low**[a,b]	-

*The basis for the **assumed risk** (e.g. the median control group risk across studies) is provided in footnotes. The **corresponding risk** (and its 95% CI) is based on the assumed risk in the comparison group and the **relative effect** of the intervention (and its 95% CI).

CI: Confidence interval; **DBT:** Dialectical behavioural therapy; **MBT:** Mentalisation-based therapy; **RCTs:** Randomised controlled trials; **RR:** Risk ratio; **SMD:** Standardized mean difference; **TAU:** Treatment-as-usual

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GRADE Working Group grades of evidence
High quality: further research is very unlikely to change our confidence in the estimate of effect
Moderate quality: further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate
Low quality: further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate
Very low quality: we are very uncertain about the estimate

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[a]We downgraded the quality of this evidence by one level due to risk of bias.
[b]We downgraded the quality of this evidence by one level due to imprecision (there was a wide CI).

BACKGROUND

Description of the condition

Borderline personality disorder (BPD) is a condition first formally described in the 20th century (Gunderson 2009). Historically, the term BPD was coined by Adolph Stern to describe a condition in the 'borderland' between psychosis and neurosis (Stern 1938). Subsequent psychoanalytic contributions (especially that of Kernberg 1975) have reaffirmed this distinction, emphasising that the capacity to test reality remains grossly intact but is subject to subtle distortions, especially under stress. The current evidence supports a biopsychological model of the aetiological factors in BPD, all of which may contribute. It is assumed that there is an interaction between the experience of adverse effects during childhood (like neglect, emotional or sexual abuse), and genetic or biological factors. Relevant biological factors include neurobiological structures, such as reduced aymgdala volume, increased volume of the pituitary gland, reduced grey matter volume in the anterior cingulate gyrus, posterior cingulate gyrus or hippocampus, and reduction in size of the right parietal cortex (Leichsenring 2011; Lieb 2004), and neurobiological dysfunctions (especially of the serotonergic system). In combination with psychosocial factors, personality traits (e.g. neuroticisms), personality functioning (self and interpersonal) and proneness to react highly emotionally may contribute to the core components of BPD, like affective and behavioural dysregulation, and disturbed relatedness (Leichsenring 2011; Lieb 2004).

According to current diagnostic criteria, BPD is characterised by a pervasive pattern of instability in affect regulation, impulse control, interpersonal relationships and self-image (APA 2013; WHO 1993). Clinical hallmarks include, amongst other things, emotional dysregulation, impulsivity, anger, repeated self-injury and chronic suicidal tendencies, together with inner emptiness and fear of abandonment (Dimaggio 2007; Fonagy 2009; Gunderson 2018; Karterud 2019; Lieb 2004). Despite the difficulties and controversies in defining and delimiting the condition, BPD is being vigorously researched still, not only in adults but also in childhood and adolescence (Chanen 2017), and is the only specific personality disorder to be carried over to the new, eleventh edition of the *International Classification of Diseases* (ICD-11) (Bach 2018; WHO 2018). The importance of effective treatments for BPD stems from the considerable psychological suffering of the persons concerned (Stiglmayr 2005; Zanarini 1998), the burden incurred on their families and significant others (Bailey 2014; Bateman 2019a), the significant impact on mental health services (Cailhol 2015; Hörz 2010; Soeteman 2008a; Tyrer 2015; Zanarini 2004; Zanarini 2012), and not least the association of BPD with debilitating functional impairments and premature death (Fok 2012; Gunderson 2011a; Gunderson 2011b; Kjær 2018; Niesten 2016; Skodol 2002; Soeteman 2008b).

The definition of BPD in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM), Fifth Edition (DSM-5; APA 2013), Fourth Edition (DMS-IV; APA 1994) and Fourth Edition Text Revision (DSM-IV-TR; APA 2000) comprises nine criteria that cover the features mentioned above. At least five criteria should be met for a definitive, categorical diagnosis of BPD to be made, and four criteria for a probable diagnosis (see Appendix 1). In the alternative diagnostic classification system of the World Health Organization (WHO), the *ICD*, which is currently in its tenth edition (ICD-10; WHO 1993), the relating condition is referred to as "Emotionally unstable personality disorder (F60.3)", of which there is an impulsive type (F60.30) and a borderline type (F60.31; see Appendix 2). The latter essentially overlaps with the DSM-IV definition and DSM-5 criteria (Ottosen 2002).

In addition to categorical classification systems, the DSM-5 also includes an alternative model for personality disorders (Section III: "Emerging Measures and Models"). This hybrid model is made up of two dimensions: 1) the severity of impairment in personality (self and interpersonal); and 2) the domains of personality traits (i.e. negative affectivity, detachment, antagonism, disinhibition, psychoticism; APA 2013, Section III). The ICD-11 (which will be in effect from 2022; WHO 2018) is also moving towards a dimensional approach, where the different types of personality disorders are being replaced with a model that focuses on the severity of core personality functioning instead. However, a specifier relating to a "Borderline pattern" will be retained. Preliminary studies have found that there is a substantial overlap between the current categorical and alternative models found in the DSM-5 (Bach 2016; Bach 2018; Sellbom 2014), as well as overlap between the dimensional models of the DSM-5 and ICD-11 (Bach 2018). Therefore, sufficient continuity between current categorical and upcoming dimensional models is warranted. The findings of this review will be applicable also to populations diagnosed with the DSM-5 Section III Hybrid BPD type and ICD-11 Borderline pattern qualifier.

The prevalence of BPD in the general population is estimated to be 1.8 % (95% CI 1.2% to 2.5%) (Winsper 2020). In clinical populations, BPD occurs frequently (Munk-Jørgensen 2010), with trials reporting a prevalence ranging from 9.3% to 46.3% and a mean point prevalence across studies of 28.5% (Torgersen 2012). BPD usually has its onset in childhood and adolescence, and younger people are affected as much as or even more often than adults (Neacsiu 2017). BPD has been found to peak around 14 to 17 years of age with a linearly decline into adulthood; however, it continues throughout the lifespan and can also be found in older people (Chanen 2007; Newton-Howes 2015; Sharp 2018; Videler 2019). Though BPD is predominantly diagnosed in women (75%; APA 2000; APA 2013), it is estimated to be almost equally frequent in men in epidemiological studies (Lenzenweger 2007; Ten Have 2016; Torgersen 2001; Torgersen 2012). Moreover, BPD commonly co-occurs with mood disorders, substance use disorder, eating disorders, post-traumatic stress disorder (PTSD), attention-deficit hyperactivity disorder (ADHD), and other specific personality disorders (Coid 2006; Lenzenweger 2007; Stepp 2012; Storebø 2014; Tomko 2014). Suicidal behaviour is reported to occur in up to 84% of people diagnosed with BPD (Goodman 2012; Soloff 2002), and it is estimated that up to 10% of those affected by BPD will die from suicide (Paris 2019). Comorbid mood disorders or substance use disorders are the most common risk factors associated with successful suicide attempts (Black 2004; Doyle 2016; Yen 2004).

Although the short- to medium-term social functioning of people with BPD is poor, diagnostic remission is around 85% within 10 years (Gunderson 2011b; Zanarini 2007). Here, however, remission only means that diagnostic criteria are not fulfilled; it does not indicate the absence of any symptoms. Indeed, whereas acute symptoms — such as self-mutilation, help-seeking suicide threats or attempts and impulsivity — decrease with time in most cases, affective symptoms reflecting areas of chronic dysphoria, such as chronic feelings of emptiness, intense anger or profound feelings

of abandonment, largely remain (Zanarini 2007). Therefore, the majority of people with BPD still have significant levels of symptoms and experience severe and persistent impairment in social functioning over time (Kongerslev 2015; Ng 2016). Risk factors for poor, long-term outcomes are comorbid substance use disorders, PTSD, and anxiety cluster disorders (Zanarini 2005; Zanarini 2007), as well as a family history of psychiatric disorder (especially mood disorders and substance use disorders), demographic issues such as older age, longer treatment history, pathological childhood experiences, temperament issues and adult psychosocial functioning (Chanen 2012; De Fruyt 2014; Kongerslev 2015; Zanarini 2007).

People with BPD have severe difficulties in achieving and maintaining vocational and social functioning over time (Hastrup 2019a; Paris 2014; Zanarini 2010). Furthermore, treatment-seeking people with personality disorders, such as BPD, pose a high economic burden on society (Hastrup 2019b; Van Asselt 2007). Effective treatments could potentially decrease the high costs associated with the condition (Soeteman 2008a). The problem of deliberate self-harm is also a particular issue within this group (Ayodeji 2015; Kongerslev 2015; Linehan 1997; Rossouw 2012b). In medical settings, people diagnosed with BPD often present after self-harming behaviour or in suicidal crisis and are treated in emergency settings, often involving repeated psychiatric hospitalisations (Cailhol 2015).

In summary, BPD is a condition that has been studied extensively. It has a major impact on health facilities as those affected often present in crisis. Recovery from symptoms or functional impairment (or both) was previously considered likely for only a small percentage of people diagnosed with BPD. However, the long-term course, in terms of symptomatic recovery, is favourable (Gunderson 2011b; Zanarini 2007; Zanarini 2012). Nonetheless, people diagnosed with BPD continue to have considerable interpersonal and functional problems, and sustainable recovery appears difficult to attain (Biskin 2015; Kongerslev 2015; Rossouw 2012b).

Description of the intervention

About three-quarters of people with BPD present to mental healthcare professionals (Tomko 2014), and they are even more likely to do so than people with mood, anxiety, or other personality disorders (Ansell 2007). Most will receive psychological interventions, because drugs are not effective for the BPD core symptoms (Goodman 2010; Tomko 2014), and these psychosocial interventions will often be provided for a relatively long periods of time (e.g. for a period of one year or longer) (Ansell 2007; Zanarini 2015).

A broad range of psychotherapies exist for BPD. The therapy can be delivered in individual or group formats, or a combination of these two treatment modalities. As for most other mental disorders, psychological interventions can be based on the traditional, major psychotherapeutic schools such as psychodynamic psychotherapy, cognitive behaviour therapy (CBT) or client-centred/humanistic therapy. In addition, several specific treatment approaches have been developed within recent decades to meet the particular challenges of treating BPD. These disorder-specific approaches are usually precisely structured and manualised (De Groot 2008; Levy 2006; Weinberg 2011). Strategies are provided for addressing interpersonal challenges, such as emotional dysregulation and impulsivity, which are core problems for people diagnosed with BPD and could lead to difficulties in forming a therapeutic alliance. Most BPD-specific psychological interventions involve multimodal therapy, treatment contracts, actively taking measures to minimise premature non-completion of treatment, providing a crisis intervention protocol and encouraging the affected one's sense of agency (Bateman 2018; Clarkin 2012; De Groot 2008; Kongerslev 2015; Livesley 2012; Weinberg 2011). They are typically highly focused on affect and the therapeutic relationship, with a relatively active therapist implementing interventions within a supportive and validating atmosphere (Bateman 2018; Clarkin 2012; De Groot 2008; Kongerslev 2015; Livesley 2012; Weinberg 2011). Eclectic therapy is an open, integrative form of psychotherapy, which adapts to the unique needs of each specific client, depending on the problem, the treatment goals and the person's expectations and motivation (Sansone 2006). Eclectic therapies integrate elements from different forms of psychotherapy.

Among the specific psychological interventions for people diagnosed with BPD, the most commonly used are: transference-focused therapy (Clarkin 1999; Yeomans 2015); mentalisation-based treatment (Bateman 2004; Bateman 2006; Bateman 2016); dialectical behaviour therapy (Linehan 1993a; Linehan 2015b); cognitive analytic therapy (Chanen 2014; Ryle 1997); schema-focused therapy (Arntz 2009; Young 2003); and the systems training for emotional predictability and problem-solving (STEPPS) (Black 2009). Most of these treatments are designed as outpatient treatments of six to 24 months duration, with once or twice weekly individual sessions. Some also include additional group therapy sessions, inpatient or day-hospital therapeutic community treatment and psychoeducation. Other potential therapies for BPD include the likes of CBT (Beck 2003), acceptance and commitment therapy (ACT; Gratz 2006), interpersonal psychotherapy (IPT; Markowitz 2006), and psychodynamic psychotherapy (e.g. psychoanalytic-interactional therapy; Streeck 2009). Broadly speaking, psychodynamic therapies aim to help people understand and reflect on their inner mental processes and make links between their past and current difficulties. Treatments based on CBT place emphasis on self-directed learning processes: people are encouraged to identify their core beliefs; evaluate and modify their behaviour accordingly; and gain new experiences. Psychotherapy is defined as the "treatment of mental illness or emotional disturbances primarily by verbal or nonverbal communication" (quote; NLM 2009).

Dialectical behavioural therapy (DBT; Linehan 1993a) is a highly structured and complex psychological therapy that was developed using some of the principles of CBT in combination with mindfulness-based and Zen-Buddhistic and dialectical thinking strategies. It aims to change behaviour and enhance the ability to tolerate difficult or painful feelings by focusing on improving skills in stress tolerance, emotion regulation, interpersonal behaviour, and mindfulness.

Mentalisation-based therapy (Bateman 2004; Bateman 2016) is a complex psychodynamic and attachment-based psychological therapy programme that aims to increase the reflective functioning or mentalising capacity of the individual, helping the person to understand and recognise the feelings they evoke in others and the feelings they experience themselves, as well as improving the capacity for emotion regulation in interpersonal relations.

Schema-focused therapy (SFT; Young 2003) draws from both cognitive-behavioural and psychoanalytic theories and helps people with BPD to identify their self-defeating core themes arising from unmet emotional needs in childhood and presenting as maladaptive coping styles in adulthood. The goal of SFT is to aid people affected by BPD in getting their needs met in adaptive ways.

Transference-focused psychotherapy (TFP; Clarkin 1999) strives to achieve integrated representations of self and others, modification of primitive defence operations, and resolution of identity diffusion by analysis of the transference within the therapeutic relationship. Primitive object relations, which can be polarised and split, may be transformed to advanced or mature object relations characterised by more integrated object relations. TFP relies on techniques of clarification, confrontation and transference interpretation within the relationship between patient and therapist.

Cognitive analytic therapy (CAT; Ryle 1997) assumes that people with BPD typically experience rapid switching from one self-state to another in a dissociate manner. The aim is to work with the patient cognitively, to identify procedural sequences, chains of events, emotions, thoughts and motivations, in order to understand how a target problem (like self-harm) is established and maintained, and to identify reciprocal roles (i.e. how early experiences are replayed later in life).

Systems training for emotional predictability and problem-solving (STEPPS; Black 2009) combines group-based psychoeducation with skills training, and targets biased social cognition driven by cognitive filters or schemas.

Dynamic deconstructive psychotherapy (DDP) is a manualised, 12- to 18-month treatment for adults diagnosed with BPD and other complex co-occurring disorders such as substance use disorders, additional personality disorders or eating disorders (Gregory 2008; Gregory 2010). The DDP model of BPD pathology draws on and combines elements of translational neuroscience, object relations theory, and the philosophy of deconstruction. The aim of DDP is to help people with BPD to connect with and verbalise their experience better, as well as to foster better interpersonal relations and self-acceptance. DDP was used in a randomised controlled trial (RCT) conducted by its developer (Gregory 2008).

Relaxation techniques and **patient education programmes** will be considered their own intervention class (i.e. not CBT or psychoanalytically based), as long as they are not explicitly grounded in or taken from a specific treatment approach (such as psychoeducation according to the DBT approach, CBT, or the SFT approach, etc.).

How the intervention might work

Evidence-based psychological therapies are based on assumptions about causality, core symptoms, and maintenance of the disorder (Kazdin 2004; Livesley 2003; Livesley 2004). The various psychotherapeutic approaches to BPD claim different mechanisms of action according to their respective models of causation (Gunderson 2018; Huprich 2015; Livesley 2004; Livesley 2016). However, they also contain a number of common elements that can account for why a number of seemingly different approaches appear to be effective in ameliorating BPD symptoms (Bateman 2015; Fonagy 2014; Kongerslev 2015; Weinberg 2011), including: a clear and highly structured treatment framework; an explicit model of BPD symptomatology; a consistent focus on the therapeutic relationship, affect regulation, tolerance of emotional states, and biases in social cognition; a high priority given to self-harm and suicidal behaviour; active therapists who deliver both support and validation as well as explorative and change-oriented interventions; mix of treatment formats (e.g. includes both individual and group therapy); and therapist support in the form of supervision and regular meetings. The symptoms of BPD are addressed using the following therapeutic approaches. Following Weinberg 2011:

1. 'emotional dysregulation' (e.g. intense anger and affective instability) is addressed through attention to affect, including raising awareness of emotional states, their triggers, and enhancing tolerance and regulative strategies;
2. 'behavioural dysregulation' (e.g. impulsivity, self-harm and suicidal behaviours) is addressed through change-oriented interventions, including, for example, challenging negative thoughts, skills training, behavioural experiments, praise, and limit setting; and
3. 'interpersonal dysfunction' (e.g. unstable relationships and stress-related paranoid ideation) is treated using interventions that enhance the social-cognitive (or mentalising) capacities of the BPD patient, through making basic and often negatively biased automatic assumptions explicit and more realistic or adaptive, and through paying attention to the establishment and maintenance of a safe and sound working alliance within the therapy sessions.

There is a risk that psychological therapies might not be helpful for all people affected by BPD, either due to the interventions delivered or through factors in the therapeutic relationship (Kongerslev 2015; Lilienfeld 2007; Parry 2016), and very little research has been done on this in people with BPD. The effectiveness of the therapy depends on the skills of the therapist to create the possibility for change with each patient. There is, therefore, the added complexity that the relationship or working alliance between the therapist and the patient itself is an ‘active ingredient’ of the therapy and that the quality of this relationship is an important predictor of outcome (Horvath 2011; Norcross 2011). There is no guarantee that the therapy will deliver what was specified in the manual or what was investigated in a randomised clinical trial (Parry 2016).

Why it is important to do this review

People with BPD and their family and friends experience high levels of psychological suffering. BPD is associated with considerable social costs in terms of service use (e.g. presentation to emergency clinics due to self-harm or suicidal crises and repeated hospitalisations) and poor psychosocial functioning (e.g. inability to complete education or get/maintain a job). Consequently, identification of effective psychological therapies for BPD is important (Stoffers-Winterling 2012).

Our review aims to provide a systematic summary of the evidence from randomised controlled trials (RCTs) in order to help people with BPD, their family and friends, mental healthcare workers, and policy and decision managers in general, to make informed decisions about evidence-based treatment for BPD.

This review is an update of two previous Cochrane Reviews on psychological therapies for BPD (Binks 2006; Stoffers-Winterling

2012). In addition to updating the two former Cochrane Reviews, our study also seeks to address some of the methodological limitations of both past and current reviews (Bateman 2015; Cristea 2017; Kliem 2010), by using updated methods, including a more comprehensive search strategy. We also had a new protocol published prior to conducting this review (Storebø 2018).

OBJECTIVES

To assess the beneficial and harmful effects of psychological therapies for people with BPD.

METHODS

Criteria for considering studies for this review

Types of studies

Randomised controlled trials (RCTs).

Types of participants

Persons of all ages, in any setting, with a formal, categorical diagnosis of BPD according to the *Diagnostic and Statistical Manual of Mental Disorders* (DSM) Third Edition (DSM-III; APA 1980), Third Edition Revised (DSM-III-R; APA 1987), Fourth Edition (DSM-IV; APA 1994), Fourth Edition Text Revision (DSM-IV-TR; APA 2000), and Fifth Edition (DSM-5; APA 2013), and the International Classification of Diseases and Related Health Problems (ICD) 10th version (WHO 1993), with or without comorbid conditions.

To meet our inclusion criteria, at least 70% of participants of a respective trial had to have a formal diagnosis of BPD. We included trials involving subsamples of people with BPD when data on those with BPD were provided separately (we asked for separate data from trials including less than 70% BPD participants). We did not include trials that focused on people with mental impairment, organic brain disorder, dementia or other severe neurologic/neurodevelopmental diseases.

Types of interventions

Any defined psychological intervention regardless of theoretical orientation (e.g. psychodynamic therapy, CBT, systemic therapy or eclectic therapies designed for BPD treatment), in any kind of treatment setting (e.g. inpatient, outpatient or day clinic), compared to:

1. control interventions, such as standard care, treatment-as-usual (TAU), waiting list or no treatment; and
2. specific psychotherapeutic interventions (that were well defined and theory driven).

We divided control interventions into two categories: The first category was “waiting list/no treatment”: participants did not receive any treatment or support from the study centre (like, e.g. clinical management, regular medical review, or support/encouragement to find a therapist outside the study centre). The second category, “TAU” included any other kinds of controls: participants were either free to use any treatment except from the respective experiential treatment (optional TAU), or they received usual community treatment, or standardised usual care (obligatory TAU).

We pooled the different types of TAU into one comparison in our main analyses, and compared the effects between the two types of TAU as well as the effect observed by comparison to TAU controls to the effects of comparisons to waiting-list/no treatment controls (see Subgroup analysis and investigation of heterogeneity).

We allowed concomitant treatments provided they were applied to both treatment conditions.

We accepted trials with active controls, including relaxation techniques such as autogenic training or meditation regimens, or patient education programmes such as self-management and community-based education programmes.

Types of outcome measures

Outcomes were either self-rated by the persons with BPD or observer-rated by clinicians, with clinician-rated outcomes being preferred. We included only adequately validated measures (plus spontaneous reporting of adverse effects).

We analysed all outcomes at post-treatment and at six months follow-up or longer.

Primary outcomes

1. BPD symptom severity, assessed by, for example, the Zanarini Rating Scale for Borderline Personality Disorder (Zan-BPD; Zanarini 2003a); the Borderline Personality Disorder Severity Index, Fourth version (BPDSI-IV; Arntz 2003) or the Clinical Global Impression Scale for people with Borderline Personality Disorder (CGI-BPD; Perez 2007).
2. Self-harm, in terms of the proportion of participants with self-harming behaviour, or assessed by, for example, the Deliberate Self-harm Inventory (DSHI; Gratz 2001) or the Self-harm behaviour Questionnaire (SHBQ; Guttierez 2001).
3. Suicide-related outcomes, assessed by, for example, the Suicidal Behaviours Questionnaire (SBQ; Osman 2001) or the Beck Scale for Suicidal Ideation (BSSI; Beck 1979), or in terms of the proportion of participants with suicidal acts.
4. Psychosocial functioning, assessed by, for example, the Global Assessment Scale (GAS; Endicott 1976), the Global Assessment of Functioning Scale (GAF; APA 1987) or the Social Functioning Questionnaire (SFQ; Tyrer 2005).

Secondary outcomes

1. Anger, assessed by, for example, the Hostility subscale of the Symptom Checklist - 90 - Revised (SCL-90-R; Derogatis 1994) or the State-Trait Anger Expression Inventory (STAXI; Spielberger 1988).
2. Affective instability, assessed by, for example, the relevant item or subscale on the Zan-BPD (Zanarini 2003a), CGI-BPD (Perez 2007) or BPDSI-IV (Arntz 2003).
3. Chronic feelings of emptiness, assessed by, for example, the relevant item or subscale on the Zan-BPD (Zanarini 2003a), CGI-BPD (Perez 2007) or BPDSI-IV (Arntz 2003).
4. Impulsivity, assessed by, for example, the Barrett Impulsiveness Scale (BIS; Barrett 1995), or the Anger, Irritability and Assault Questionnaire (AIAQ; Coccaro 1991).
5. Interpersonal problems, assessed by, for example, the Inventory of Interpersonal Problems (IIP; Horowitz 1988), or the relevant item or subscale on the Zan-BPD (Zanarini 2003a), CGI-BPD

(Perez 2007), BPDSI-IV (Arntz 2003), or SCL-90-R (Derogatis 1994).

6. Abandonment, assessed by, for example, the relevant item or subscale on the Zan-BPD (Zanarini 2003a), CGI-BPD (Perez 2007) or BPDSI-IV (Arntz 2003).
7. Identity disturbance, assessed by, for example, the relevant item or subscale on the Zan-BPD (Zanarini 2003a), CGI-BPD (Perez 2007) or BPDSI-IV (Arntz 2003).
8. Dissociation and psychotic-like symptoms, assessed by, for example, the Dissociative Experience Scale (DES; Bernstein 1986), or the Brief Psychiatric Rating Scale (BPRS; Overall 1962).
9. Depression, assessed by, for example, the Beck Depression Inventory (BDI; Beck 1961) or the Montgomery Åsberg Depression Rating Scale (MADRS; Montgomery 1979).
10. Attrition, in terms of participants lost after randomisation in each group.
11. Adverse effects, measured by the use of standardised psychometric rating scales, such as the Systematic Assessment for Treatment Emergent Events (SAFTEE; Levine 1986), or by laboratory values or spontaneous reporting. We defined adverse effects as unfavourable outcomes that occurred during or after psychotherapy but that were not necessarily caused by it (see Chapter 19 in the *Cochrane Handbook for Systematic Reviews of Interventions*; Peryer 2019. We divided any reported adverse effects into severe and non-severe, according to the International Committee of Harmonization guidelines (ICH 1996). We defined serious adverse effects as any event that led to death, was life-threatening, required inpatient hospitalisation or prolongation of existing hospitalisation, resulted in persistent or significant disability, or any important medical event that may have jeopardised the participant's health or required intervention to prevent one of the aforementioned outcomes occurring. We considered all other adverse effects to be non-serious.

Search methods for identification of studies

Electronic searches

We searched the electronic databases and trials registers listed below up to March 2019.

1. Cochrane Central Register of Controlled trials (CENTRAL; 2019, Issue 3), in the Cochrane Library, which includes the Cochrane Developmental, Psychosocial and Learning Problems Specialised Register (searched 20 March 2019).
2. MEDLINE Ovid (1948 to 20 March 2019).
3. Embase Ovid (1980 to 20 March 2019).
4. CINAHL EBSCOhost (Cumulative Index to Nursing and Allied Health Literature; 1980 to 20 March 2019).
5. PsycINFO Ovid (1806 to 20 March 2019).
6. ERIC EBSCOhost (Education Resources Information Center; 1966 to 20 March 2019).
7. BIOSIS Previews Web of Science Clarivate Analytics (1969 to 20 March 2019).
8. Web of Science Core Collection Clarivate Analytics (1900 to 20 March 2019).
9. Sociological Abstracts ProQuest (1952 to 20 March 2019).
10. LILACS (Latin American and Caribbean Health Science Information database; lilacs.bvsalud.org/en; searched 20 August 2019).
11. OpenGrey (www.opengrey.eu; searched 20 August 2019).
12. Library Hub Discover,previously COPAC (Library Hub Discover; searched 20 August 2019).
13. ProQuest Dissertations and Theses A&I (1743 to 20 March 2019).
14. DART Europe E-Theses Portal (www.dart-europe.eu/basic-search.php; searched 20 August 2019).
15. Networked Digital Library of Theses and Dissertations (NDLTD; www.ndltd.org; searched 20 August 2019).
16. Australian New Zealand Clinical trials Registry (ANZCTR; www.anzctr.org.au/BasicSearch.aspx; searched 20 August 2019).
17. Clinicaltrials.gov (clinicaltrials.gov; searched 20 March 2019).
18. EU Clinical trials Register (www.clinicaltrialsregister.eu/ctr-search/search; searched 20 August 2019).
19. ISRCTN Registry (www.isrctn.com; searched 20 August 2019).
20. Be Part of research (www.ukctg.nihr.ac.uk/#popoverSearchDivId; searched 20 August 2019).
21. WHO International Clinical trials Registry Platform (ICTRP; who.int/ictrp/en; searched 20 March 2019).

The search strategies for all databases can be found in Appendix 3. We did not limit our searches by language, year of publication, or type of publication. We sought translation of the relevant sections of non-English language articles.

Searching other resources

We handsearched relevant journals, including: Journal of Personality Disorders; American Journal of Psychiatry; JAMA Psychiatry; British Journal of Psychiatry; ACTA Psychiatrica Scandinavica; Journal of the American Academy of Child and Adolescent Psychiatry; Personality Disorders: Theory, Research and Treatment; and Journal of Clinical Psychiatry. Additionally, we emailed researchers working in the field, to ask for unpublished data. We also checked abstracts of key conferences for BPD (congresses of the European and the International Society for the Study of Personality Disorders; ESSPD and ISSPD, respectively) and asked for any relevant unpublished data. We traced cross-references from relevant literature. On 13 December 2019, we ran searches to make sure that none of our included trials had been retracted due to error or fraud. In the next update of this review, we will handsearch additional journal titles for relevant trials, (see Differences between protocol and review).

Data collection and analysis

We conducted this review in accordance with the guidelines set out in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2019), and performed analyses using the latest version of Review Manager 5 (RevMan 5), Cochrane's statistical software (Review Manager 2014).

We report only the methods used in successive sections below. Planned but unused methods can be found in the protocol, Storebø 2018, and additional Table 1.

Selection of studies

Twelve review authors (OJS, JMSW, BAV, JTM, HEC, AT, CPS, MTK, SSN, MLK, MSJ, EF) worked in six pairs and independently screened titles and abstracts of all records retrieved by the searches. For any record that could have been an eligible RCT, we obtained the full-text report and assessed it for eligibility against the inclusion criteria (see Criteria for considering studies for this review). During all stages of study selection, we resolved uncertainty or disagreement by consensus. When agreement could not be reached, the review authors discussed disagreements and consulted a third review author (KL, OJS, JMSW or ES).

We list apparently relevant RCTs that did not fulfil the inclusion criteria, along with reasons for their exclusion, in the Characteristics of excluded studies tables. We used Covidence software to keep track of appraised trials and decisions. To ensure transparency of study selection, we provided flow charts according to the QUOROM statement, showing how many records have been excluded for a certain reason (Moher 1999).

Data extraction and management

We developed data extraction forms to facilitate standardisation of data extraction. The form was piloted by OJS, SSN, MTK.

Working in pairs, all review authors extracted data independently using the data collection form to ensure accuracy. We resolved disagreements by discussion or by using an arbiter (ES), if required.

OJS, HEC, AT, EF, and JMSW entered data into RevMan 5 (Review Manager 2014). After all data had been entered, another reviewer (JMSW, OJS) re-checked the data for completeness and accuracy, to make sure the data were complete, correct and appropriately categorised. Any entered data were verified against the original publication, and we updated the list of outcomes (Appendix 4), if necessary.

Assessment of risk of bias in included studies

Using Cochrane's tool for assessing risk of bias (Higgins 2011), all review authors assessed the risk of bias in each included trial across the following domains: random sequence generation; allocation concealment; blinding of outcome assessment; incomplete outcome data, selective outcome reporting; and other potential sources of bias. Data extractors independently assigned each trial to one of three categories (low risk of bias, unclear (uncertain) risk of bias or high risk of bias), according to guidelines provided in the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2011), using the criteria set out in Appendix 5. We called upon a third review author (ES) to resolve any ongoing disagreements, when needed.

Considering bias due to a lack of blinding is undoubtedly of importance, but it remains unclear how best to deal with this issue in research practice (Boutron 2008). We decided not to judge the likelihood of detection bias due to inadequate blinding of participants and personnel, as it is almost impossible to blind therapists and people receiving treatment in psychological therapy outcome research. However, we assessed the likelihood of detection bias due to inadequate blinding of outcome assessors.

In accordance with Cochrane's guidelines (Higgins 2011), we also included other potential sources of bias as a final bias component. Here, we included: the likelihood of performance bias due to inadequate treatment adherence; the likelihood of bias due to different amounts of attention given to the treatment groups (attention bias); and other potential sources of bias, such as allegiance bias. We defined allegiance bias as a therapist's personal belief both in the superiority and the efficacy of a particular treatment. This belief can be based on an education in that particular treatment. This bias is especially strong if the inventor of a treatment is investigating the effects of the particular treatment he/she has invented.

We considered trials with one or more unclear or high risk of bias domains as trials at high risk of bias overall, due to the risk of overestimating beneficial effects and underestimating harmful effects in RCTs with unclear or inadequate methodological quality (Kjaergard 2001; Lundh 2012; Moher 1998; Savović 2012a; Savović 2012b; Schulz 1995; Wood 2008). We defined trials with a low risk of bias in all domains to be at low risk of bias overall.

Measures of treatment effect

Continuous data

For continuous data, we compared the mean score between the two groups to give a mean difference (MD) and presented this with 95% confidence intervals (CIs). We used the overall MD, where possible, to combine the same outcome measures from trials. If two or more different instruments were used to measure the same construct, we reported the effect sizes as standardised mean differences (SMD) in the meta-analysis. We calculated SMDs on the basis of post-treatment results and, in separate analyses, follow-up data. We grouped follow-up data in six-month intervals (zero to six months, six to 12 months and 12 months and over). Where the direction of a scale was opposite to most of the other scales, we multiplied the corresponding mean values by −1 to ensure adjusted values. If the trials did not report means and standard deviations (SDs) but reported other values like t-tests and P values, we tried to transform these into SDs.

To identify the minimum relevant clinical difference (MIREDIF), we transformed the SMD to MD, using the scale with the best validity and reliability for the given outcome. For the analyses of the four primary outcomes in the comparison of psychotherapy versus TAU, we transformed SMDs into MDs on the following scales, to assess whether results exceeded the MIREDIF: ZAN-BPD Scale, Delibarate Self-Harm Inventory (DSHI), Suicidal Attempt Self Injury Interview (SASII), Global Assessment of Functioning (GAF), and the Hamilton Depression scale. We identified a MIREDIF of −3.0 points on the ZAN-BPD, ranging from 0 to 36 points, based on a trial by Crawford 2018a; a MIREDIF of −1.25 points on the DSHI, ranging from 0 to 34 points, which corresponds to ½ SD based on a trial by Farivar 2004; a MIREDIF of −0.17 points on the Suicidal Attempt Self Injury Interview, ranging from 0 to 4 points, which corresponds to ½ SD based on a trial by Farivar 2004; and a MIREDIF of −4.0 on the GAF scale, ranging from 0 to 100, based on a trial by Amri 2014. The MIREDIF of the Hamilton Depression scale is 3.0 points (NICE CG90). For other outcomes, we provided an interpretation of the effect size using Cohen's D, considering 0.2 as a small effect, 0.5 as a medium effect size, and 0.8 as a large effect size (Cohen 1988).

Dichotomous data

We summarised dichotomous data as risk ratios (RRs) with 95% CIs. The RR is the ratio of the risk of an event in the two groups. We

decided to use the RR as it may be easier to interpret than odds ratios (ORs).

Unit of analysis issues

Repeated observations

We calculated trial estimates on the basis of post-treatment group results. We conducted separate analyses for data from different points of measurement (i.e. post-treatment, follow-up data of 0- to 6-month, 6- to 12-month, and above 12-month intervals, where we used the last measurement within these intervals). If a trial reported data at both 7-month and 11-month follow-up periods, we included both; however, we categorised cases like the 11-month follow-up as above 12-month follow-up. We did not use interim observations (Thalheimer 2002).

Adjustment for multiplicity

Multiplicity reflects the concern that performing multiple comparisons increases the risk of falsely rejecting the null hypothesis. Multiplicity, therefore, may affect the results found within a systematic review and, as a result, needs to be adjusted for. We adjusted the P values and CIs of the primary outcomes and one secondary outcome (depression) for multiplicity using the method described by (Jakobsen 2014).

Dealing with missing data

We tried to obtain any missing data, including incomplete outcome data, by contacting trial authors. We report this information in the 'Risk of bias' tables.

We evaluated the methods used to handle the missing data in the publications and to what extent it was likely that the missing data had influenced the results of outcomes of interest. We calculated effect sizes on the basis of intention-to-treat data, if that was possible. If only available case analysis data were reported, we calculated effect sizes on this basis.

We consulted a statistician if data were not reported in an immediately usable way and if data required processing before being analysed. We assessed results derived from statistically processed data in sensitivity analyses. See Sensitivity analysis.

Assessment of heterogeneity

We assessed trials for clinical homogeneity with respect to type of therapy, therapy setting and control group. We evaluated methodological heterogeneity by comparing the designs of trials. For any trials judged as homogeneous and adequate for pooling, we investigated statistical heterogeneity by both visual inspection of the graphs and the I^2 statistic (Higgins 2003). We considered I^2 values between 0% and 40% as indication of little heterogeneity, between 30% and 60% as indication of moderate heterogeneity, between 50% and 90% as indication of substantial heterogeneity, and between 75% and 100% as indication of considerable heterogeneity (Higgins 2019). Along with the size of the I^2 scores, we also took into account the P value, CI and the overall number of included trials in the respective analysis when interpreting the values (Deeks 2019).

Assessment of reporting biases

We drew funnel plots (estimated differences in treatment effects against their standard error) and performed Egger's statistical test for small-study effects for the primary outcomes; asymmetry in the funnel plot could be due to publication bias or could indicate genuine heterogeneity between small and large trials (Higgins 2019). It is important to assess the funnel axis in the funnel plot as a significant Egger's test could also indicate publication bias or be due to genuine small treatment effects. We did not visually inspect the funnel plot if fewer than 10 trials were included in the meta-analysis, in accordance with the recommendations of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2019; Egger 1997; Sterne 2017).

Data synthesis

We performed the statistical analyses in accordance with the recommendations in the latest version of the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2019).

In carrying out meta-analyses, we used the inverse-variance method, to give more weight to more precise estimates from trials with less variance (mostly larger trials). This minimises the imprecision of the pooled effect estimate, and is a common and simple approach to conducting meta-analyses (Higgins 2019). We used the random-effects model for our meta-analyses, since we expected some degree of clinical heterogeneity to be present in most cases, though not too substantial to prevent pooling in principle. Where only one trial was included in an analysis, we used the fixed-effect model, and where different models led to different results (Sensitivity analysis), we reported the results of both models.

For trials with a high level of statistical heterogeneity, and where the amount of clinical heterogeneity made it inappropriate to use these trials in meta-analyses, we provide a narrative description of the trial results. If data pooling seemed feasible, we pooled the primary trials' effects and calculated their 95% CIs.

If a trial reported data for a particular outcome using two or more assessment instruments (e.g. several questionnaires for the assessment of depression), we selected the one used most often in the whole pool of included trials for effect size calculation, in order to minimise heterogeneity of outcomes in form and content. If a trial reported data of two assessment instruments that were equally frequently used, two review authors discussed the issue and chose the one that was, in its content, the most appropriate for the assessment of people affected by BPD.

We divided the doses and the controls into the different comparisons, ensuring that the treatment comparisons were comparable and homogeneous.

We have two main overarching comparisons. In the first comparison, we pooled all of the different types of psychotherapy together and compared them with the different types of TAU pooled together. In the second comparison, we pooled all of the different types of psychotherapy and compared them with waiting list or no treatment. Within in each comparison, we broke down the interventions by therapeutic category compared with different types of TAU, waiting list, no treatment or with another psychotherapy (active control).

Subgroup analysis and investigation of heterogeneity

We conducted the following prespecified subgroup analyses for two primary outcomes (BPD symptom severity and psychosocial

functioning), where data were sufficient, in order to make hypotheses.

1. Therapeutic approaches: specific therapies versus each other (only analyses with two or more trials were included in this subgroup)
2. Age: mean age of 15 to 18 years versus older than 18 years
3. Duration: less than six months versus six to 12 months versus over 12 months
4. Mode of therapy: individual therapy versus group therapy and with the combination of individual and group therapy
5. Setting: inpatient versus outpatient and the combination of inpatient and outpatient

In addition, we added the following four subgroup analyses post hoc, for the primary outcomes of BPD symptom severity and psychosocial functioning.

1. Type of raters: self-rated versus clinician-rated
2. Types of TAU: obligatory TAU versus unspecified TAU
3. Type of comparison group: trials comparing psychotherapy plus TAU versus trials comparing psychotherapy with waiting list or no treatment
4. Types of scales: different measuring scales versus each other

Trial Sequential Analysis

Trial Sequential Analysis (TSA) is a methodology that combines a required information size (RIS) calculation for a meta-analysis with the threshold for statistical significance (Brok 2008; Brok 2009; Thorlund 2009; Wetterslev 2008). TSA is a tool for quantifying the statistical reliability of the data in a cumulative meta-analysis, adjusting P values for sparse data and for repetitive testing on accumulating data (Brok 2008; Brok 2009; Thorlund 2009; Wetterslev 2008).

Comparable to the a priori sample size estimation in a single randomised trial, a meta-analysis should include an RIS calculation at least as large as the sample size of an adequately powered single trial to reduce the risk of random error. TSA calculates the RIS in a meta-analysis and provides an alpha-spending boundary to adjust the significance level for sparse data and repetitive testing on accumulating data (CTU 2011; Wetterslev 2008); hence, the risk of random error can be assessed. Multiple analyses of accumulating data when new trials emerge leads to repeated significant testing and introduces multiplicity. Thus, use of a conventional P value is prone to exacerbate the risk of random error (Berkey 1996; Lau 1995). Meta-analyses not reaching the RIS are analysed with trial sequential alpha-spending monitoring boundaries analogous to interim monitoring boundaries in a single trial (Wetterslev 2008). This approach will be crucial in coming updates of the review.

If a TSA does not reveal significant findings (no crossing of the alpha-spending boundary and no crossing of the conventional boundary of P = 0.05) before the RIS has been reached, then the conclusion should either be that more trials are needed to reject or accept an intervention effect that was used for calculation of the required sample size or — in case the cumulated Z-curve enters the futility area — the anticipated effect can be rejected.

We used a MIREDIF from studies defining this or, where we could not find this, we used an assumption that the minimal relevant clinical intervention effect was approximately ½ SD on the used scale, which can be used as a MIREDIF (Norman 2003).

We calculated the diversity-adjusted required information size (DARIS; that is the number of participants required to detect or reject a specific intervention effect in a meta-analysis), and performed a TSA for the primary outcomes at the end of treatment for the main comparison versus TAU, based on the following a priori assumptions:

1. the SD of the primary outcomes;
2. an anticipated MIREDIF defined in a trial reporting on this or we used a ½ SD on the used scale;
3. a maximum type I error of 2.0% (due to four primary outcomes; Jakobsen 2014);
4. a maximum type II error of 10% (minimum 90% power; Castellini 2018); and
5. the diversity observed in the meta-analysis.

We furthermore performed a TSA for the three secondary outcomes (for the main comparison versus TAU) not closely connected to the BPD core symptoms (depression, attrition and adverse effects) based on the following priori assumptions:

1. the SD of the primary outcomes;
2. an anticipated MIREDIF defined in a trial reporting on this or we used a ½ SD on the used scale;
3. a maximum type I error of 0.8% (due to 11 secondary outcomes; Jakobsen 2014);
4. a maximum type II error of 10% (minimum 90% power; Castellini 2018); and
5. the diversity observed in the meta-analysis.

We only performed a TSA for depression as this was the only significant finding.

Sensitivity analysis

We conducted sensitivity analyses to determine whether findings were sensitive to:

1. imprecision, as assessed by GRADE, by conducting TSA analyses on all primary outcomes and for the three secondary outcomes (for the main comparison versus TAU) not closely connected to the BPD core symptoms (depression, attrition and adverse effects) with significant findings.
2. random-effects or fixed-effect models.

Summary of findings and assessment of the certainty of the evidence

We used the GRADE approach to construct 'Summary of findings' tables in which to document the results of review outcomes. Two reviewers (HEC and JSW) , working independently, assessed the quality of the evidence. Any conflicts were resolved by consulting a third author (OJS). The GRADE approach appraises the quality of a body of evidence based on the extent to which one can be confident that an estimate of effect or association reflects the item being assessed. Considerations are due to: within-trial risk of bias; directness of the evidence; heterogeneity of the data; precision of effect estimates; and risk of publication bias (Andrews 2013a; Andrews 2013b; Balshem 2011; Brunetti 2013; Guyatt 2011a; Guyatt 2011b; Guyatt 2011c; Guyatt 2011d; Guyatt 2011e; Guyatt 2011f;

Guyatt 2011g; Guyatt 2013a; Guyatt 2013b; Guyatt 2013c; Mustafa 2013). When possible, we reported the MD or the RR, and we used TSA to rate imprecision (Jakobsen 2014). TSA can be used as a secondary analysis in Cochrane Reviews, to provide an additional interpretation of the data from a specific perspective, and can be used for testing imprecision (Thomas 2019).

We report the four primary outcomes (BPD severity, self-harm, suicide-related outcomes and psychosocial functioning) and three secondary outcomes not closely connected to the BPD core symptoms (depression, attrition and adverse effects) in 'Summary of findings' tables for our two main comparisons (Atkins 2004): psychotherapy versus treatment-as-usual (Summary of findings 1); and psychotherapy versus waiting list or no treatment (Summary of findings 2). We also created a third 'Summary of findings' table in which we report data from the DBT and MBT treatments with the highest numbers of primary trials, with DBT being the subject of roughly one-third of all included trials, followed by MBT with seven RCTs. In this table, we report only the primary outcomes (see Summary of findings 3).

RESULTS

Description of studies

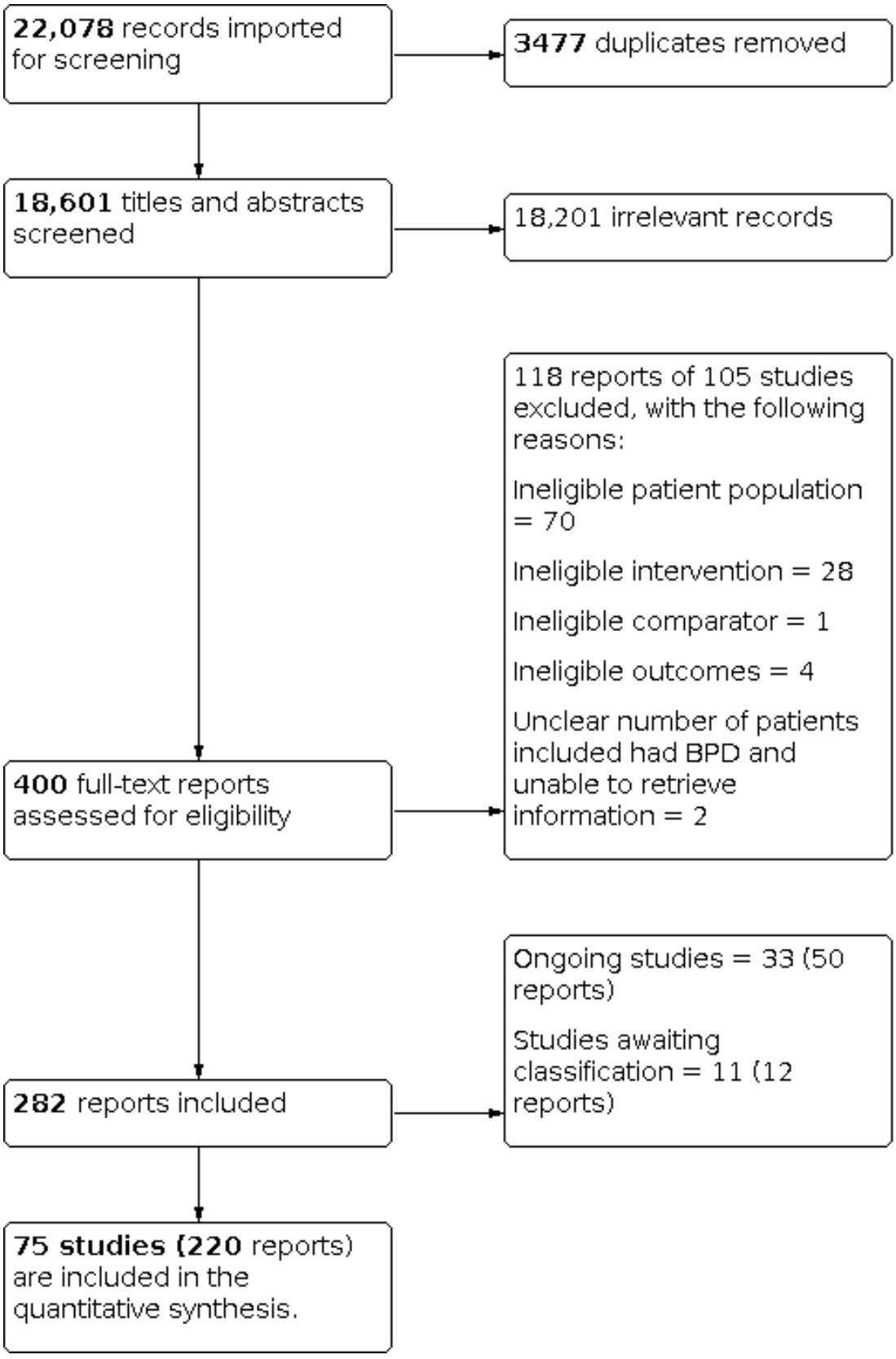
See Characteristics of included studies, Characteristics of excluded studies, Characteristics of studies awaiting classification and Characteristics of ongoing studies tables.

Results of the search

All electronic databases and search periods are listed in the Methods section (see Electronic searches). There were no language, date or document format restrictions. This current review is part of a series of reviews on interventions for BPD. Therefore, we used a very comprehensive search strategy, covering all psychotherapeutic or pharmacological treatment (or both) of BPD.

Altogether, the searches generated 22,078 records, of which 3477 were duplicates. Following screening of titles and abstracts, 400 citations merited closer inspection. An assessment of full texts for possible inclusion into this review led to the exclusion of 118 reports. This left 282 reports included. Of these, 50 reports referred to 33 different ongoing trials (see Ongoing studies). Another 12 reports related to 11 different trials that we were unable to classify definitively as included or excluded at this point of time, despite our best efforts to retrieve further information from the trial authors (see Studies awaiting classification). This finally left 220 reports relating to 75 different included trials (see Included studies, and Figure 1).

Figure 1. Study flow diagram



Included studies

Below, we summarise the key characteristics of the included trials. For information about which trials correspond to which characteristics for certain categories below, please see Table 2. Further detail can also be found in the Characteristics of included studies tables.

Design

We included 75 randomised, parallel-arm trials.

Sample sizes

There was considerable variation in sample sizes between the trials, as the total number of participants with BPD ranged from 16 (Gleeson 2012) to 190 participants (McMain 2009). Five trials had a sample size of more than 100 participants (Table 2).

Setting

Sixty-three trials were conducted in outpatient settings, five in inpatient settings, and seven in both inpatient and outpatient settings (see Table 2).

Participants

The 75 trials included a total of 4507 participants with BPD; the mean age ranged from 14.8 to 45.7 years. Seventeen trials included only female participants and two trials included only males (see Table 2). All remaining trials included participants of both genders, predominantly females.

Diagnostic criteria

Participants were diagnosed as having BPD according to DSM-III, DSM-III-R, DSM-IV, DSM-IV-TR, or ICD-10 criteria (see Table 2). The diagnosis was confirmed by standardised means of assessment. The most frequently used assessment instruments were the Structured Clinical Interviews for DSM-III-R or DSM-IV Axis II Personality Disorders (SCID-II) (First 1997; Spitzer 1989) in 47 trials. Eleven trials applied the Diagnostic Interview for Borderline Personality Disorder patients (DIB; Gunderson 1981) or the Diagnostic Interview for Borderline Personality Disorder Patients - revised (DIB-R; Zanarini 1989). Six trials made use of the International Personality Disorder Examination (IPDE; Loranger 1995). All assessment instruments used in the included trials are listed in Table 2.

Participants exclusion criteria of primary studies

In 39 trials, people with evident mental impairment, organic brain disorder and neurological conditions were not eligible for participation. In addition, with the exception of Bos 2010 and Kredlow 2017a, schizophrenia, schizoaffective and other psychotic disorders were reasons for exclusion in all trials. Participants with substance abuse or dependence were not eligible for inclusion in 43 trials. Four trials included participants with alcohol or substance abuse/dependence (Davidson 2014; Gregory 2008b; Robinson 2016; Santisteban 2015). Comorbid personality disorders were not a reason for exclusion in 71 trials. Nine trials excluded participants with antisocial features or full antisocial personality disorders. See Table 2 for a list of the trials.

Interventions

Durations of interventions

The duration of the trials ranged from one month (Jahangard 2012) to 36 months (Giesen-Bloo 2006). Thirty-six trials had a duration of less than six months. Thirty-two trials lasted between six months and 12 months. See Table 2.

Formats of interventions

Most of the trials applied individual treatment, with a total of 33 trials investigating the effects of individual therapy. Twenty-two trials investigated the effects of group therapy whereas 16 trials assessed a combination of individual and group therapy (see Table 2).

Types of interventions

We included any defined, psychological intervention. The following provides a brief overview and description of the interventions investigated in the individual trials. For a more elaborate description, see the relevant references.

Dialectical behaviour therapy (DBT) and modified DBT-related treatments (DBT; Linehan 1993a; Linehan 1993b). Twenty-four trials investigated the effect of DBT and DBT-related treatments (Bohus 2013; Bianchini 2019; Carter 2010; Elices 2016; Feigenbaum 2012; Feliu-Soler 2017; Gratz 2014; Harned 2014; Kamalabadi 2012; Koons 2001a; Kramer 2016; Lin 2019; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; McMain 2009; McMain 2017; Mohamadizadeh 2017; Priebe 2012; Soler 2009; Stanley 2017; Turner 2000; Van den Bosch 2005).

Cognitive behavioural therapy (CBT) and CBT- related treatments. Eleven trials investigated the effect of CBT and CBT-related treatments (Bellino 2007; Cottraux 2009; Davidson 2006; Davidson 2014; Jahangard 2012; Kramer 2011; Kramer 2014; Kredlow 2017a; Kredlow 2017b; McMurran 2016; Schilling 2018).

Psychoeducation. One trial investigated a generic form of psychoeducation in which the first step (awareness of BPD) of the STEPPS programme was taught (Pascual 2015), and one trial included a once-only workshop (Zanarini 2008).

Cognitive analytic therapy (CAT) and CAT-related treatments. One trial investigated the effect of CAT (Gleeson 2012).

Psychodynamic psychotherapy and related treatments were investigated by three trials: psychic representation-focused psychotherapy in Reneses 2013; psychoanalytic-interactional therapy in Leichsenring 2016; and sequential brief Adlerian psychodynamic psychotherapy in Amianto 2011.

Dynamic deconstructive psychotherapy (DDP). One trial investigated the effect of DDP (Gregory 2008b).

Schema-focused therapy (SFT) and SFT-related treatments. Four trials investigated the effect of SFT and SFT-related treatment (Farrell 2009; Giesen-Bloo 2006; Mohamadizadeh 2017; Nadort 2009).

Acceptance and commitment therapy (ACT) employs mindfulness and acceptance strategies. One trial investigated the effect of ACT (Morton 2012).

Mentalisation-based treatment (MBT) and MBT-related treatments. Six trials investigated the effect of MBT and MBT-related treatments (Bateman 1999; Bateman 2009; Jørgensen 2013; Philips 2018; Robinson 2016; Rossouw 2012b).

Interpersonal psychotherapy (IPT) and IPT-related treatments. Four trials investigated the effect of IPT (Bellino 2006; Bellino 2007; Bellino 2010; Smith 2012).

Client-centred therapy (CCT) and related treatments aim to encourage the patient to find solutions to their own problems and to help them decide how they need to change. Two trials investigated the effect of CCT (Cottraux 2009; Turner 2000).

Manual-assisted cognitive treatment (MACT) is used to treat people who are acutely self-harming. The treatment is structured around a self-help book. Two trials investigated the effect of MACT (Morey 2010; Weinberg 2006).

Systems training for emotional predictability and problem-solving for borderline personality disorder (STEPPS) is a seminar-like, group treatment programme that combines cognitive-behavioural elements and skills training. Two trials investigated the effect of STEPPS (Blum 2008; Bos 2010).

Eclectic treatments included art therapy (Haeyen 2018), abandonment psychotherapy and intensive community treatment (Andreoli 2016), a combination of individual SFT and group DBT (Leppänen 2016), combined inpatient and outpatient psychotherapy (Antonsen 2017), integrative BPD-oriented adolescent family therapy (Santisteban 2015), joint crises plan (Borschmann 2013), web-based psychoeducation (Zanarini 2018), and motivation feedback (Jochems 2015). Eight trials investigated eclectic treatments.

Concomitant treatment

Medication use was not allowed in three trials (Lin 2019; Mohamadizadeh 2017; Zanarini 2018). The majority of trials allowed participants to continue their respective drug treatments if initiated before the start of the trial (59 trials). Only four out of 75 RCTs gave the same medication to all participants (fluoxetine in the first three trials, selective serotonin reuptake inhibitors not further specified in the latter) (Bellino 2006; Bellino 2007; Bellino 2010; Jahangard 2012). One trial, Stanley 2017, included four treatment groups, which we integrated into two groups of DBT and supportive treatment. Fifty percent of each of these two groups additionally received either fluoxetine or placebo. Concomitant drug use was not specified in nine trials (Bianchini 2019; Carter 2010; Davidson 2014; Haeyen 2018; Kamalabadi 2012; Leppänen 2016; Philips 2018; Robinson 2016; Santisteban 2015). Two trials included medication-free participants only (Lin 2019; Mohamadizadeh 2017; see Table 2).

Comparisons

The review includes 25 different comparisons.

Control interventions

The kinds of control interventions varied widely and included, for example, treatment-as-usual (TAU), waiting list, no treatment or an active treatment. The composition of the control interventions used in the individual trials differed as to whether TAU was obligatory or optional.

The majority of trials (42 trials) included a control intervention with an obligatory TAU. Thirteen trials included a control intervention with optional TAU. See Table 2.

Active treatment

Twenty-two trials included an active head-to-head comparison.

1. Antonsen 2017: inpatient plus outpatient psychotherapy versus outpatient psychotherapy
2. Bellino 2007: cognitive therapy versus interpersonal therapy
3. Carmona í Farrés 2019: dialectical behaviour therapy (DBT) mindfulness versus DBT interpersonal effectiveness
4. Cottraux 2009: cognitive therapy versus client-centred therapy (CCT)
5. Elices 2016: DBT mindfulness versus DBT interpersonal effectiveness
6. Feliu-Soler 2017: DBT mindfulness versus loving-kindness and compassion meditation
7. Giesen-Bloo 2006: schema-focused therapy (SFT) versus transference-focused therapy
8. Harned 2014: standard DBT versus DBT prolonged exposure (PE)
9. Kramer 2011 and Kramer 2014: motive-oriented therapeutic relationship (MOTR) versus general psychiatric management (GPM)
10. Kredlow 2017b: cognitive behavioural therapy (CBT) versus trauma-related plus anxiety-related psychoeducation
11. Lin 2019: DBT skills training versus cognitive therapy
12. Linehan 2015a: standard DBT versus DBT skills plus case management versus DBT individual therapy plus activity
13. McMain 2009: DBT versus general psychiatric management (GPM)
14. Mohamadizadeh 2017: DBT versus SFT
15. Morey 2010: manual-assisted cognitive therapy (MACT) versus MACT plus therapeutic assessment (TA)
16. Nadort 2009: SFT versus SFT plus therapist telephone crisis support outside office hours
17. Pascual 2015: pseudoeducation versus neurocognitive rehabilitation group
18. Santisteban 2015: BPD-oriented adolescent family therapy versus individual drug counselling
19. Schilling 2018: meta-cognitive training for borderline personality disorder (B-MCT) versus progressive muscle relaxation training (PMR)
20. Sinnaeve 2018: standard DBT (outpatient) versus step-down DBT (combined inpatient and outpatient DBT)
21. Turner 2000: DBT versus CCT
22. Kramer 2016: DBT informed and individual treatment versus TAU

Outcomes

When several measures were available for the same outcome, we chose the measure that was used most often, in order to reduce heterogeneity of outcomes in form and content. Outcomes could be either self-reported by people treated or observer-rated by clinicians, with clinician-rated outcomes being preferred. We included outcomes reported at the end of treatment and at ≥ six months follow-up. trials used a variety of scales to assess both primary and secondary outcomes. The table of outcomes in Appendix 4 presents the list of scales used to assess the outcomes

in the individual trials. The list refers to the measurement scales described in the original reports.

Adverse effects

Data on adverse effects were available from five trials (Andreoli 2016; Davidson 2014; McMurran 2016; Robinson 2016; Stanley 2017). Two more trials reported to have recorded adverse effects, but we could not use the data for effect size calculation, either because the final results were not reported (Pascual 2015) or it was unclear in which treatment group the events occurred (Leichsenring 2016). Adverse effects were either recorded as and when people reported them, or the exact method of assessment was not specified.

We categorised adverse effects as serious (life-threatening, resulting in death or requiring inpatient hospitalisation; available from Andreoli 2016; Davidson 2014; McMurran 2016; Robinson 2016; Stanley 2017) or non-serious (any other adverse effects; available from McMurran 2016; Stanley 2017).

Funding source

The majority of trials (k = 62) were funded by grants from universities, authorities or research foundations (see Table 2). Four trials reported that no funding was received (Bellino 2006; Bellino 2007; Bellino 2010; Jahangard 2012). The nine remaining trials did not specify funding (Andreoli 2016; Bianchini 2019; Carter 2010; Kamalabadi 2012; Koons 2001a; Leppänen 2016; Mohamadizadeh 2017; Morton 2012; Turner 2000).

Excluded studies

In total, we excluded 105 trials from 118 full-text reports (see Characteristics of excluded studies tables). Of these, 70 trials included an ineligible patient population, 28 assessed ineligible interventions, 1 included an ineligible comparator, 2 had unclear numbers of participants with BPD included (we were unable to retrieve information), and 4 did not include any relevant outcomes (see Figure 1).

Studies awaiting classification

We included 11 trials as awaiting classification, of which we were unable to retrieve four trials, two of the trials were conference abstracts, two of the trials need to be translated, and three trials did not provide subsample data for people affected by BPD (see Characteristics of studies awaiting classification tables for an elaborated description). All trials investigated different types of psychotherapeutic treatments for people affected by BPD or individuals with PTSD or suicidal behaviour.

Three trials involved CBT treatments for BPD (Akbari 2009; Dorrepaal 2012; Johnson 2017) and five trials involved DBT treatments (Abdelkarim 2016; Cowperthwait 2017; McCauley 2018; Ostermeier 2017; Santamarina 2017). One trial apiece investigated ACT (Ducasse 2018), MBT (Einy 2018) and the STEPPS programme (Isaia 2017).

Three trials involved adolescents (Cowperthwait 2017; McCauley 2018; Santamarina 2017), whereas the rest involved adults.

Ongoing studies

We included 33 ongoing trials assessing different types of psychological interventions for the treatment of BPD, for which the outcome data are not yet available (see Characteristics of ongoing studies tables).

The majority of trials investigated the effect of CBT, DBT or related treatment for individuals with BPD displaying self-harm or suicidal behaviour. More specifically, nine trials investigated DBT (ACTRN12612001187831; ACTRN12616000236493; NCT02134223; NCT02387736; NCT02517723; NCT02991586; NCT03191565; NCT03297840; NCT03833453), five trials investigated MBT (ACTRN12612000951853; NCT02068326; NCT02771691; NCT03677037; NL2168/NTR2292), three trials investigated cognitive behavioural treatments (DRKS00003605; ISRCTN21802136; NCT01531634), three trials investigated SFT (DRKS00011534; NL1144/NTR1186; NL2266/NTR2392), two trials investigated STEPPS programmes (NCT03092271; NL3856/NTR4016), two trials investigated self-help or psychoeducation interventions (NCT03185026; NCT03376113), one investigated a meditation-based treatment (NCT02125942), one investigated internet-based treatment (NCT03418142), and one an emotional regulation treatment (NCT03011190). Five trials investigated other interventions like early interventions and general care (ACTRN12610000100099; NCT00603421; NCT01823120; NCT02685943; NCT02985047).

One trial investigated adolescents (NCT02771691) whereas the other trials investigated adults.

Risk of bias in included studies

Figure 2 and Figure 3 shows the review authors´ judgements concerning the risk of bias across the included trials and for each individual trial, respectively. Further information for the individual trials can be found in Characteristics of included studies tables.

Figure 2. Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies.

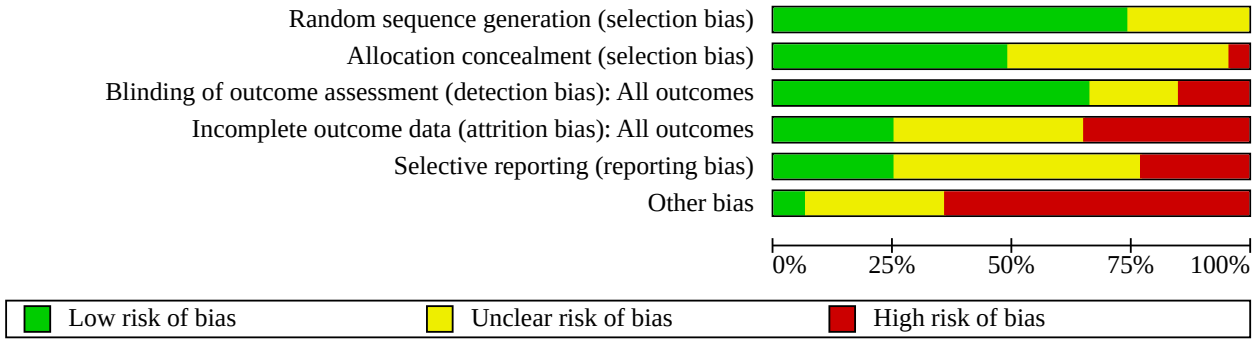


Figure 3. Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

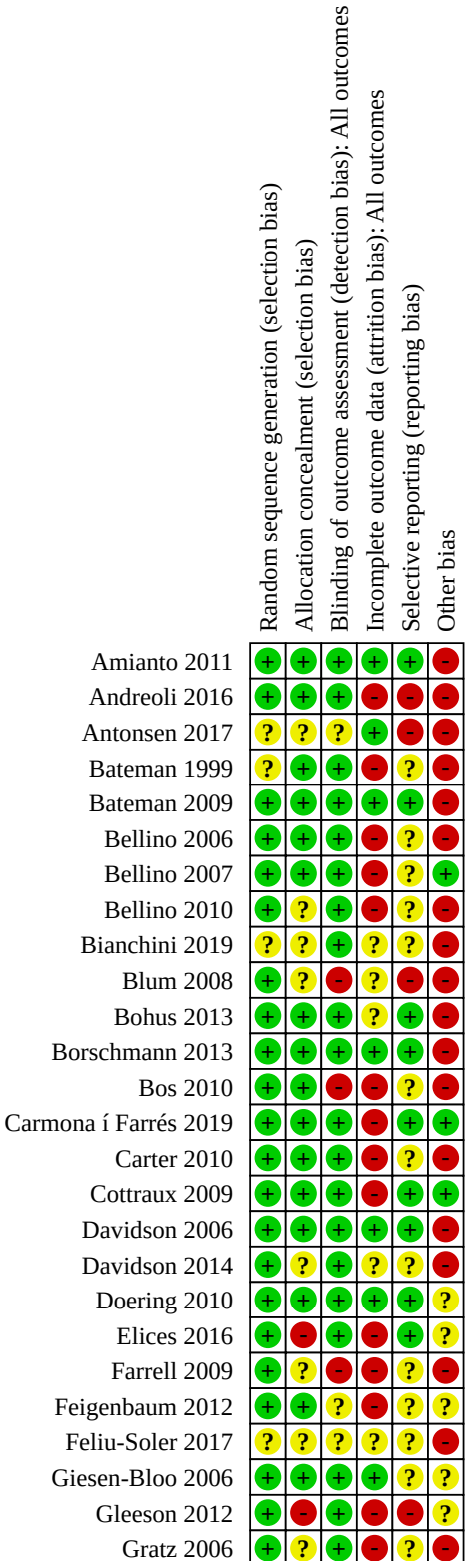


Figure 3. (Continued)

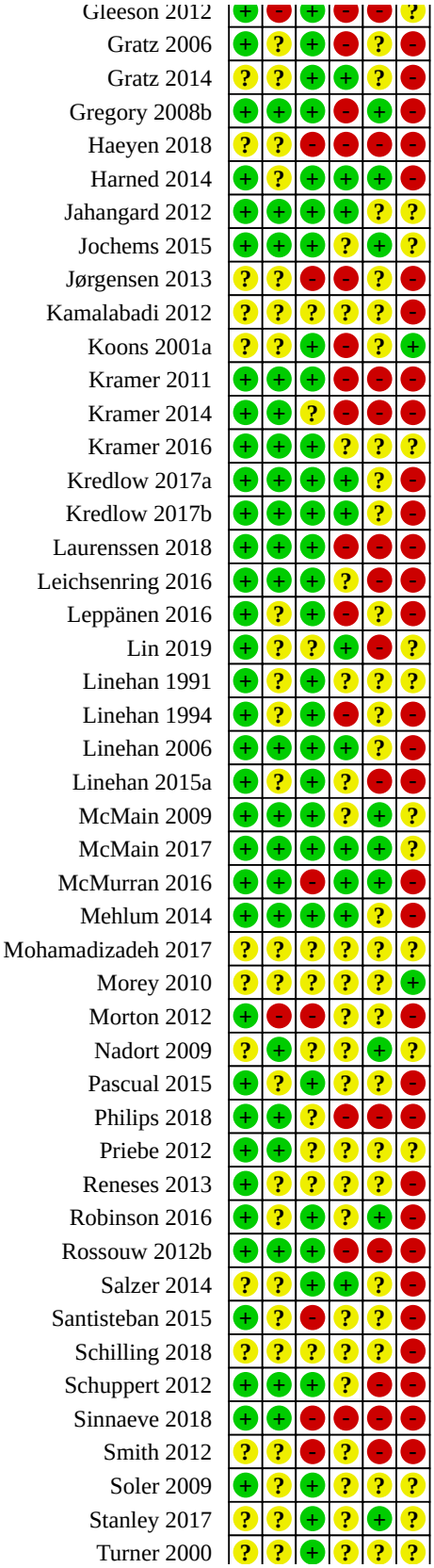
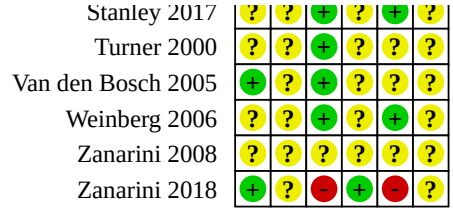


Figure 3. (Continued)



Allocation

Sequence generation

There is evidence that poor reporting of randomisation increases the odds of presenting significant outcomes (Chalmers 1983; Schulz 1995). The trials provided further information on how the randomisation sequence had been achieved, or that a stratification was used. We judged 56 trials, where a randomisation method was reported, as having low risk of bias (Amianto 2011; Andreoli 2016; Bateman 2009; Bellino 2006; Bellino 2007; Bellino 2010; Blum 2008; Bohus 2013; Borschmann 2013; Bos 2010; Carmona í Farrés 2019; Carter 2010; Cottraux 2009; Davidson 2006; Davidson 2014; Doering 2010; Elices 2016; Farrell 2009; Feigenbaum 2012; Giesen-Bloo 2006; Gleeson 2012; Gratz 2006; Gregory 2008b; Harned 2014; Jahangard 2012; Jochems 2015; Kramer 2011; Kramer 2014; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Lin 2019; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; McMain 2009; McMain 2017; McMurran 2016; Mehlum 2014; Morton 2012; Pascual 2015; Philips 2018; Priebe 2012; Reneses 2013; Robinson 2016; Rossouw 2012b; Santisteban 2015; Schuppert 2012; Sinnaeve 2018; Soler 2009; Van den Bosch 2005; Zanarini 2018). The 19 remaining trials did not describe exactly how treatment allocation had been achieved, so we rated these trials at unclear risk of bias (Antonsen 2017; Bateman 1999; Bianchini 2019; Feliu-Soler 2017; Gratz 2014; Haeyen 2018; Jørgensen 2013; Kamalabadi 2012; Koons 2001a; Mohamadizadeh 2017; Morey 2010; Nadort 2009; Salzer 2014; Schilling 2018; Smith 2012; Stanley 2017; Turner 2000; Weinberg 2006; Zanarini 2008)

Allocation concealment

Thirty-seven trials, reporting off-site randomisation or notification of assignment by research coordinators not involved in delivering the therapy, were rated as having a low risk of bias (Amianto 2011; Andreoli 2016; Bateman 1999; Bateman 2009; Bellino 2006; Bellino 2007; Bohus 2013; Borschmann 2013; Bos 2010; Carmona í Farrés 2019; Carter 2010; Cottraux 2009; Davidson 2006; Doering 2010, Feigenbaum 2012; Giesen-Bloo 2006; Gregory 2008b; Jahangard 2012; Jochems 2015; Kramer 2011; Kramer 2014; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016; Linehan 2006; McMain 2009; McMain 2017; McMurran 2016; Mehlum 2014; Nadort 2009; Philips 2018; Priebe 2012; Rossouw 2012b; Schuppert 2012; Sinnaeve 2018). Thirty-five trials that did not provide enough information to enable a judgement to be made about adequacy of allocation concealment were rated as having an unclear risk of bias (Antonsen 2017; Bellino 2010; Bianchini 2019; Blum 2008; Davidson 2014; Farrell 2009; Feliu-Soler 2017; Gratz 2006; Gratz 2014; Haeyen 2018; Harned 2014; Jørgensen 2013; Kamalabadi 2012; Koons 2001a; Leppänen 2016; Lin 2019; Linehan 1991; Linehan 1994; Linehan 2015a; Mohamadizadeh 2017; Morey 2010; Pascual 2015; Reneses 2013; Robinson 2016; Salzer 2014; Santisteban 2015; Schilling 2018; Smith 2012; Soler 2009; Stanley 2017; Turner 2000; Van den Bosch 2005; Weinberg 2006; Zanarini 2008; Zanarini 2018). We rated three trials as being at high risk of bias due to explicit inadequate allocation concealment (Elices 2016; Gleeson 2012; Morton 2012). One example can be found in Gleeson 2012, where the following was stated: "Outcome ratings were made by the trial research assistant who was independent of the treatment, but not blind to treatment allocation because of limited resources" (quote). This could potentially have induced bias.

Blinding

The majority of trials (50 trials) reported that outcome assessors were kept blind to treatment allocation and, for this reason, were considered to be at low risk of bias (Amianto 2011; Andreoli 2016; Bateman 1999; Bateman 2009; Bellino 2006; Bellino 2007; Bellino 2010; Bianchini 2019; Bohus 2013; Borschmann 2013; Carmona í Farrés 2019; Carter 2010; Cottraux 2009; Davidson 2006; Davidson 2014: Doering 2010; Elices 2016; Giesen-Bloo 2006; Gleeson 2012; Gratz 2006; Gratz 2014; Gregory 2008b; Harned 2014; Jahangard 2012; Jochems 2015; Koons 2001a; Kramer 2011; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; McMain 2009; McMain 2017; Mehlum 2014; Pascual 2015; Robinson 2016; Rossouw 2012b; Salzer 2014; Schuppert 2012; Soler 2009; Stanley 2017; Turner 2000; Van den Bosch 2005; Weinberg 2006). Fourteen trials did not have an adequate description of the blinding of the outcome assessors and thus were judged to be at unclear risk of bias (Antonsen 2017; Feigenbaum 2012; Feliu-Soler 2017; Kamalabadi 2012; Kramer 2014; Lin 2019; Mohamadizadeh 2017; Morey 2010; Nadort 2009; Philips 2018; Priebe 2012; Reneses 2013; Schilling 2018; Zanarini 2008). Eleven trials reported inadequate blinding of outcome assessors and thus were considered to be at high risk of bias (Blum 2008; Bos 2010; Farrell 2009; Haeyen 2018; Jørgensen 2013; McMurran 2016; Morton 2012; Santisteban 2015; Sinnaeve 2018; Smith 2012; Zanarini 2018).

Incomplete outcome data

The majority of trials either did not adequately describe the possible reasons for missing data, and therefore were considered to be at unclear risk of bias (30 trials: Bianchini 2019; Blum 2008; Bohus 2013; Davidson 2014; Feliu-Soler 2017; Jochems 2015; Kamalabadi 2012; Kramer 2016; Leichsenring 2016; Linehan 1991; Linehan 2015a; McMain 2009; Mohamadizadeh 2017; Morey 2010; Morton 2012; Nadort 2009; Pascual 2015; Priebe 2012; Reneses 2013; Robinson 2016; Santisteban 2015; Schilling 2018; Schuppert 2012; Smith 2012; Soler 2009; Stanley 2017; Turner 2000; Van den Bosch 2005; Weinberg 2006; Zanarini 2008), or did not explicitly address obvious missing data and therefore were considered to

be at high risk of bias (26 trials: Andreoli 2016; Bateman 1999; Bellino 2006; Bellino 2007; Bellino 2010; Bos 2010; Carmona í Farrés 2019; Carter 2010; Cottraux 2009; Elices 2016; Farrell 2009; Feigenbaum 2012; Gleeson 2012; Gratz 2006; Gregory 2008b; Haeyen 2018; Jørgensen 2013; Koons 2001a; Kramer 2011; Kramer 2014; Laurenssen 2018; Leppänen 2016; Linehan 1994; Philips 2018; Rossouw 2012b; Sinnaeve 2018). Nineteen trials showed no indication of incomplete outcome reporting, and thus were considered to be at low risk of bias (Amianto 2011; Antonsen 2017; Bateman 2009; Borschmann 2013; Davidson 2006; Doering 2010; Giesen-Bloo 2006; Gratz 2014; Harned 2014; Jahangard 2012; Kredlow 2017a; Kredlow 2017b; Lin 2019; Linehan 2006: McMain 2017; McMurran 2016; Mehlum 2014; Salzer 2014; Zanarini 2018).

Selective reporting

The majority of trials (39 trials) either did not have a published protocol prior to initiating the trials or did not provide sufficient information in the report to judge the extent of reporting bias. We considered these trials to be at unclear risk of bias (Bateman 1999; Bellino 2006; Bellino 2007; Bellino 2010; Bianchini 2019; Bos 2010; Carter 2010; Davidson 2014; Farrell 2009; Feigenbaum 2012; Feliu-Soler 2017; Giesen-Bloo 2006; Gratz 2006; Gratz 2014; Jahangard 2012; Jørgensen 2013; Kamalabadi 2012; Koons 2001a; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Leppänen 2016; Linehan 1991; Linehan 1994; Linehan 2006; Mehlum 2014; Mohamadizadeh 2017; Morey 2010; Morton 2012; Pascual 2015; Priebe 2012; Reneses 2013; Salzer 2014; Santisteban 2015; Schilling 2018; Soler 2009; Turner 2000; Van den Bosch 2005; Zanarini 2008). Seventeen trials did not explicitly report data for prespecified outcomes even though they initially had planned to report them. We considered these trials to be at high risk of bias (Andreoli 2016; Antonsen 2017; Blum 2008; Gleeson 2012; Haeyen 2018; Kramer 2011; Kramer 2014; Laurenssen 2018; Leichsenring 2016; Lin 2019; Linehan 2015a; Philips 2018; Rossouw 2012b; Schuppert 2012; Sinnaeve 2018; Smith 2012; Zanarini 2018). We rated 19 trials at low risk of bias due to the fact that they had published a protocol or registered the trial before conducting the trial, and reported all prespecified outcomes (Amianto 2011; Bateman 2009; Bohus 2013; Borschmann 2013; Carmona í Farrés 2019; Cottraux 2009; Davidson 2006; Doering 2010; Elices 2016; Gregory 2008b; Harned 2014; Jochems 2015; McMain 2009; McMain 2017; McMurran 2016; Nadort 2009; Robinson 2016; Stanley 2017; Weinberg 2006).

Other potential sources of bias

Other sources of bias included insufficient treatment adherence, allegiance bias and attention bias. The total score for this outcome was based on the highest score of bias. A detailed description of which domains are critical for the individual trials can be found in the Characteristics of included studies tables.

Most trials (48 trials) exhibited high risk of bias in one or more of the assessed domains (Amianto 2011; Andreoli 2016; Antonsen 2017; Bateman 1999; Bateman 2009; Bellino 2006; Bellino 2010; Bianchini 2019; Blum 2008; Borschmann 2013; Bohus 2013; Bos 2010; Carter 2010; Davidson 2006; Davidson 2014; Farrell 2009; Feliu-Soler 2017; Gratz 2006; Gratz 2014; Gregory 2008b; Haeyen 2018; Harned 2014; Jørgensen 2013; Kamalabadi 2012; Kramer 2011; Kramer 2014; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016 Leppänen 2016; Linehan 1994; Linehan 2006; Linehan 2015a; McMurran 2016; Mehlum 2014; Morton 2012; Pascual 2015; Philips 2018; Reneses 2013; Robinson 2016; Rossouw 2012b; Salzer 2014; Santisteban 2015; Schilling 2018; Schuppert 2012; Sinnaeve 2018; Smith 2012). Twenty-two trials had at least one domain that was not adequately described in the trials and therefore were considered to be at unclear risk of bias (Doering 2010; Elices 2016; Feigenbaum 2012; Giesen-Bloo 2006; Gleeson 2012; Jahangard 2012; Jochems 2015; Kramer 2016; Lin 2019; Linehan 1991; McMain 2009; McMain 2017; Mohamadizadeh 2017; Nadort 2009; Priebe 2012; Soler 2009; Stanley 2017; Turner 2000; Van den Bosch 2005; Weinberg 2006; Zanarini 2008; Zanarini 2018). Only five trials had an overall low risk of bias for all the domains assessed as other potential sources of bias (Bellino 2007; Carmona í Farrés 2019; Cottraux 2009; Koons 2001a; Morey 2010).

Effects of interventions

See: **Summary of findings 1** Psychotherapy versus treatment-as-usual; **Summary of findings 2** Psychotherapy versus waiting list or no treatment; **Summary of findings 3** Dialectical behavioural therapy or mentalisation-based therapy versus treatment-as-usual

We present the results for each of the primary and secondary outcomes connected to the 25 comparisons below. Where a meta-analysis involved two or more different instruments to measure the same construct, we reported effect sizes as SMD, otherwise we reported the MD. To identify the MIREDIF, we transformed the SMD to MD for the scale with best validity and reliability for that outcome. For the analyses of the four primary outcomes in the comparison of psychotherapy versus TAU, we transformed the SMD into MD on the following scales, to assess whether results exceeded the minimum clinically important difference: ZAN BPD Scale, DSHI, Suicidal Attempt Self Injury Interview, GAF scale, and the Hamilton Depression scale.

We contacted the authors of 44 trials with unclear or missing data and requested the necessary information. Twenty-four trial authors replied with answers (Amianto 2011; Bateman 1999; Bellino 2006; Blum 2008; Borschmann 2013; Carmona í Farrés 2019; Carter 2010; Doering 2010; Elices 2016; Farrell 2009; Gleeson 2012; Gratz 2006; Kredlow 2017a; Kredlow 2017b; Leppänen 2016; Mehlum 2014; Morton 2012; Priebe 2012; Robinson 2016; Salzer 2014; Schilling 2018; Sinnaeve 2018; Smith 2012; Soler 2009).

We performed TSA on all primary outcomes and for the secondary outcome depression.at end of treatment for the main comparison versus TSA in our 'Summary of findings' tables, adjusting for multiplicity and sparse data.

We considered all trials as being at high risk of bias overall. However, we used all eligible trials in the meta-analyses, as the *Cochrane Handbook for Systematic Reviews of Interventions* recommends doing so when all trials are assigned the same risk of bias. We took account of our 'Risk of bias' assessment when considering the quality of the evidence using the GRADE approach, to ensure that judgements about risk of bias and other factors affecting the quality of the evidence were taken into account when interpreting the results of the review (Higgins 2011; Higgins 2019).

1. Psychotherapy versus treatment-as-usual (TAU)

Primary outcomes

1.1 BPD symptom severity (continuous)

Twenty-three trials reported continuous data on BPD symptom severity (in total for all time points) (Amianto 2011; Blum 2008;

Bateman 1999; Bos 2010; Doering 2010; Farrell 2009; Gratz 2006; Gratz 2014; Gregory 2008b; Jørgensen 2013; Koons 2001a; Kredlow 2017a; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Morton 2012; Philips 2018; Priebe 2012; Reneses 2013; Robinson 2016; Rossouw 2012b; Schuppert 2012; Soler 2009).

Generally, psychotherapy improved BPD symptom severity at end of treatment compared with TAU (SMD −0.52, 95% CI −0.70 to −0.33; 22 trials, 1244 participants; I^2 = 57%; P < 0.001; Analysis 1.1.1; moderate-quality evidence, Summary of findings 1). This corresponds to a MD of −3.6 (95% CI −4.4 to -2.08) on the ZAN-BPD scale, which ranges from 0 to 36. This represents a clinical relevant improvement in BPD symptoms. The MIREDIF on this scale is −3.0 points (Crawford 2018a). The TSA analysis showed that the RIS was reached (n = 907), and that there was no risk of type 1 error (TSA adjusted confidence interval −5.49 to −1.90) (see figure 4 in Appendix 6).

Inspection of the funnel plot (see figure 5 in Appendix 6) suggested potential bias (very small asymmetry), and we found evidence of possible significant publication bias: Egger's regression intercept (bias) 2.234 (two tailed, P = 0.043). Analysis 1.1.1. might be more difficult to understand as we found asymmetry in the funnel plot and also a significant Egger's test. All effect estimates spread unequivocally at the left-hand side of the zero line, clearly favouring experimental treatments over controls. However, identifying smaller sample size trials with insignificant results would be unlikely to change our pooled estimate substantially because these smaller trials would only contribute lesser weights to the pooled estimates. Hence, we concluded that our findings were not essentially influenced by publication bias.

Generally, psychotherapy did not reduce BPD symptom severity at zero to six months follow-up compared with TAU (SMD −0.59, 95% CI −1.23 to 0.05; 2 trials, 41 participants; I^2 = 0%; P = 0.17; Analysis 1.1.2).

Generally, psychotherapy did not reduce BPD symptom severity at six to 12 months follow-up compared with TAU (SMD −0.04, 95% CI −0.36 to 0.27; 2 trials, 157 participants; I^2 = 0%; P = 0.79; Analysis 1.1.3).

Generally, psychotherapy did not reduce BPD symptom severity at above 12 months follow-up compared with TAU (SMD −0.94, 95% CI −2.58 to 0.70; 2 trials, 97 participants; I^2 = 92%; P = 0.26; Analysis 1.1.4).

1.2 BPD symptom severity (dichotomous)

One trial reported dichotomous data on BPD symptom severity (Davidson 2006).

Generally, psychotherapy did not reduce BPD symptom severity at above 12 months follow-up compared with TAU (RR 0.91, 95% CI 0.56 to 1.48; 1 trial, 76 participants; P = 0.71; Analysis 1.2).

No data were available for end of treatment, zero to six months and six to 12 months follow-up.

1.3 Self-harm (continuous)

Thirteen trials reported continuous data on self-harm (Amianto 2011; Borschmann 2013; Carter 2010; Feigenbaum 2012; Gratz 2006; Gratz 2014; Koons 2001a; Linehan 1991; Linehan 2006; Philips 2018; Priebe 2012; Van den Bosch 2005; Weinberg 2006).

Generally, psychotherapy improved self-harm at end of treatment compared with TAU (SMD −0.32, 95% CI −0.49 to −0.14; 13 trials, 616 participants; I^2 = 16%; P = 0.0004; low-quality evidence, Summary of findings 1). This corresponds to a MD of −0.82 (95% CI −1.25 to 0.35), on the DSHI, which ranges from 0 to 34. The MIREDIF on this scale is −1.25 points, which corresponds to ½ SD (Farivar 2004). Clinically, this represents no clinically important reduction in self-harm for people with BPD. The TSA analysis showed that the RIS was reached (n = 97). However, we cannot exclude the potential risk of type 1 error (TSA adjusted confidence interval −0.59 to −0.08) (see figure 6 in Appendix 6).

Inspection of the funnel plot (see figure 7 in Appendix 6) suggested no potential bias (asymmetry), and we found no evidence of possible significant publication bias: Egger's regression intercept (bias) 1.524 (two tailed, P = 0.237).

Generally, psychotherapy did not reduce self-harm at zero to six months follow-up compared with TAU (SMD −0.52, 95% CI −1.28 to 0.23; 1 trial, 28 participants; P = 0.18; Analysis 1.3.2); MD −4.71, 95% CI −11.60 to 2.18; 1 trial, 28 participants; P = 0.18; Analysis 1.3.2).

Generally, psychotherapy did not reduce self-harm at six to 12 months follow-up compared with TAU (SMD −0.18, 95% CI −0.48 to 0.12; 3 trials, 174 participants; I^2 = 0%; P = 0.64; Analysis 1.3.3).

No data were available for 12 months and over follow-up.

1.4 Self-harm (dichotomous)

Six trials reported dichotomous data on self-harm (Bateman 1999; Bateman 2009; Bos 2010; Davidson 2006; Doering 2010; Rossouw 2012b).

Generally, psychotherapy did not reduce self-harm at end of treatment compared with TAU (RR 0.85, 95% CI 0.63 to 1.14; 6 trials, 513 participants; I^2 = 73%; P = 0.28; Analysis 1.4.1).

Generally, psychotherapy reduced self-harm at zero to six months follow-up compared with TAU (RR 0.14, 95% CI 0.04 to 0.56; 1 trial; P = 0.005; Analysis 1.4.2).

Generally, psychotherapy reduced self-harm at six to 12 months follow-up compared with TAU (RR 0.27, 95% CI 0.10 to 0.68; 1 trial; P = 0.006; Analysis 1.4.3).

Generally, psychotherapy reduced self-harm at above 12 months follow-up compared with TAU (RR 0.33, 95% CI 0.15 to 0.76; 1 trial, 41 participants; P = 0.009; Analysis 1.4.4).

1.5 Suicide-related outcomes (continuous)

Thirteen trials reported continuous data on suicide-related outcomes (Amianto 2011; Andreoli 2016; Davidson 2006; Feigenbaum 2012; Gleeson 2012; Gregory 2008b; Koons 2001a; Leppänen 2016; Linehan 2006; Mehlum 2014; Reneses 2013; Soler 2009; Weinberg 2006).

Generally, psychotherapy reduced suicide-related outcomes at end of treatment compared with TAU (SMD −0.34, 95% CI −0.57 to −0.11; 13 trials, 666 participants; I^2 = 43%; P = 0.004; Analysis 1.5.1; low-quality evidence, Summary of findings 1). The improvement

corresponded to a clinical effect MD of −0.11 (95% CI −0.19 to −0.034), on the Suicidal Attempt Self Injury Interview. The MIREDIF on this scale is −0.17 points, which corresponds to ½ SD (Farivar 2004). Clinically, this represents no reduction in suicide-related outcomes for people with BPD. The TSA analysis showed that the required information size was reached (n = 253). However, we cannot exclude the potential risk of type 1 error, and that there was no risk of type 1 error (TSA adjusted confidence interval −0.18 to −0.04) (see figure 8 in Appendix 6).

Inspection of the funnel plot (see figure 9 in Appendix 6) suggested potential bias (asymmetry), and we found no evidence of possible significant publication bias: Egger's regression intercept (bias) 0.405 (two tailed, P = 0.735).

Generally, psychotherapy did not reduce suicide-related outcomes at zero to six months follow-up compared with TAU (SMD −0.43, 95% CI −1.10 to 0.23; 2 trials, 36 participants; I^2 = 0%; P = 0.20; Analysis 1.5.2).

Generally, psychotherapy reduced suicide-related outcomes at six to 12 months follow-up compared with TAU (SMD −0.42, 95% CI −0.80 to −0.04; 2 trials, 109 participants; I^2 = 0%; P = 0.03; Analysis 1.5.3).

Generally, psychotherapy did not reduce suicide-related outcomes at above 12 months follow-up compared with TAU (SMD −0.31, 95% CI −0.77 to 0.14; 1 trial, 76 participants; P = 0.18; MD −1.15, 95% CI −2.86 to 0.56; 1 trial, 76 participants; P = 0.19; Analysis 1.5.4).

1.6 Suicide-related outcomes (dichotomous)

Five trials reported dichotomous data on suicide-related outcomes (Bateman 1999; Bateman 2009; Doering 2010; Philips 2018; Stanley 2017).

Generally, psychotherapy reduced suicide-related outcomes at end of treatment compared with TAU (RR 0.27, 95% CI 0.11 to 0.67; 5 trials, 396 participants; I^2 = 45%; P = 0.005; Analysis 1.6.1).

Generally, psychotherapy did not reduce suicide-related outcomes at zero to six months follow-up compared with TAU (RR 0.25, 95% CI 0.06 to 1.05; 1 trial, 41 participants; P = 0.06; Analysis 1.6.2).

Generally, psychotherapy reduced suicide-related outcomes at above 12 months follow-up compared with TAU (RR 0.29, 95% CI 0.11 to 0.74; 1 trial, 41 participants; P = 0.01; Analysis 1.6.3).

No data were available for six to 12 months follow-up.

1.7 Psychosocial functioning

Twenty-two trials reported continuous data on psychosocial functioning (Amianto 2011; Andreoli 2016; Bateman 1999; Bateman 2009; Blum 2008; Borschmann 2013; Carter 2010; Davidson 2006; Doering 2010; Farrell 2009; Feigenbaum 2012; Gleeson 2012; Gratz 2014; Gregory 2008b; Jochems 2015; Jørgensen 2013; Kramer 2016; Linehan 1994; Mehlum 2014; Reneses 2013; Salzer 2014; Soler 2009).

Generally, psychotherapy improved psychosocial functioning at end of treatment compared with TAU (SMD −0.45, 95% CI −0.68 to −0.22; 22 trials, 1314 participants; I^2 = 72%; P = 0.0001; Analysis 1.7.1; low-quality evidence, Summary of findings 1). This corresponds to a MD of −2.8 (95% CI −4.25 to −1.38), on the GAF scale, which ranges from 0 to 100. The MIREDIF on this scale is −4.0 points (Amri 2014). This finding does not represent a clinically important improvement in psychosocial functioning for people with BPD. The TSA analysis showed that the RIS was reached (n = 947), and that there was no risk of type 1 error (TSA adjusted confidence interval −3.97 to −1.94) (see figure 10 in Appendix 6).

Inspection of the funnel plot in (see figure 11 in Appendix 6) suggested potential bias (asymmetry), and we found no evidence of possible significant publication bias: Egger's regression intercept (bias) 1.50 (two tailed, P = 0.241).

Generally, psychotherapy did not improve psychosocial functioning at zero to six months follow-up compared with TAU (SMD −1.23, 95% CI −2.74 to 0.29; 1 trial, 9 participants; P = 0.11; MD −15.80, 95% CI −2.74 to 0.29; 1 trial, 9 participants; P = 0.11; Analysis 1.7.2).

Generally, psychotherapy did not improve psychosocial functioning at six to 12 months follow-up compared with TAU (SMD −0.09, 95% CI −0.40 to 0.23; 3 trials, 247 participants; I^2 = 30%; P = 0.59; Analysis 1.7.3).

Generally, psychotherapy did not improve psychosocial functioning at above 12 months follow-up compared with TAU (SMD −0.27, 95% CI −0.60 to 0.05; 6 trials, 499 participants; I^2 = 60%; P = 0.10; Analysis 1.7.4).

Secondary outcomes

1.8 Anger

Eight trials reported continuous data on anger (Amianto 2011; Feigenbaum 2012; Gleeson 2012; Koons 2001a; Leppänen 2016; Linehan 1994; Linehan 2006; Soler 2009)

Generally, psychotherapy reduced anger at end of treatment compared with TAU (SMD −0.38, 95% CI −0.64 to −0.12; 8 trials, 323 participants; I^2 = 21%; P = 0.005; Analysis 1.8.1).

Generally, psychotherapy did not reduce anger at zero to six months follow-up compared with TAU (SMD −1.20, 95% CI −2.82 to 0.41; 1 trial, 8 participants; P = 0.14; MD −4.50, 95% CI −9.01 to 0.01; 1 trial, 8 participants; P = 0.05; Analysis 1.8.2).

Generally, psychotherapy did not reduce anger at six to 12 months follow-up compared with TAU (SMD −0.12, 95% CI −0.50 to 0.25; 2 trials, 111 participants; I^2 = 0%; P = 0.52; Analysis 1.8.3).

Generally, psychotherapy did not reduce anger at above 12 months follow-up compared with TAU (SMD 0.02, 95% CI −0.42 to 0.46; 1 trial, 80 participants; P = 0.93; MD 0.01, 95% CI −0.20 to 0.22; 1 trial, 80 participants; P = 0.93; Analysis 1.8.4).

1.9 Affective instability

Twelve trials reported continuous data on affective instability (Amianto 2011; Bianchini 2019; Blum 2008; Farrell 2009; Gratz 2006; Gratz 2014; Leppänen 2016; Morton 2012; Reneses 2013; Salzer 2014; Schuppert 2012; Soler 2009).

Generally, psychotherapy improved affective instability at end of treatment compared with TAU (SMD −0.68, 95% CI −0.98 to −0.39; 12 trials, 620 participants; I^2 = 65%; P < 0.001; (Analysis 1.9.1).

Generally, psychotherapy did not improve affective instability at six to 12 months follow-up compared with TAU (SMD −0.52, 95% CI −1.21 to 0.18; 1 trial, 33 participants; P = 0.15; MD −0.70, 95% CI −1.59 to 0.19; 1 trial, 33 participants; P = 0.12; Analysis 1.9.2).

No data were available for zero to six months and above 12 months follow-up.

1.10 Chronic feelings of emptiness

Four trials reported continuous data on chronic feelings of emptiness (Amianto 2011; Leppänen 2016; Reneses 2013; Soler 2009).

Generally, psychotherapy improved chronic feelings of emptiness at end of treatment compared with TAU (SMD −0.39, 95% CI −0.69 to −0.10; 4 trials, 187 participants; I^2 = 0%; P = 0.009; Analysis 1.10.1).

Generally, psychotherapy did not improve chronic feelings of emptiness at six to 12 months follow-up compared with TAU (SMD −0.58, 95% CI −1.28 to 0.11; 1 trial, 37 participants; P = 0.10; MD −0.60, 95% CI −1.39 to 0.09; 1 trial, 33 participants; P = 0.09; Analysis 1.10.2).

No data were available for zero to six months and above 12 months follow-up.

1.11 Impulsivity (continuous)

Ten studiies reported continuous data on impulsivity (Amianto 2011; Bianchini 2019; Blum 2008; Farrell 2009; Gratz 2006; Gratz 2014; Leppänen 2016; Reneses 2013; Soler 2009; Van den Bosch 2005).

Generally, psychotherapy improved impulsivity at end of treatment compared with TAU (SMD −0.54, 95% CI −0.84 to −0.25; 10 trials, 491 participants; I^2 = 58%; P = 0.0003; Analysis 1.11.1).

Generally, psychotherapy did not improve impulsivity at six to 12 months follow-up compared with TAU (SMD 0.32, 95% CI −0.13 to 0.77; 2 trials, 77 participants; I^2 = 0%; P = 0.16; Analysis 1.11.2).

No data were available for zero to six months and above 12 months follow-up.

1.12 Impulsivity (dichotomous)

One trial reported dichotomous data on impulsivity (Bos 2010).

Generally, psychotherapy did not improve impulsivity at end of treatment compared with TAU (RR 0.93, 95% CI 0.66 to 1.29; 1 trial, 58 participants; P = 0.65; Analysis 1.12).

No data were available for zero to six months, six to 12 months, and above 12 months follow-up.

1.13 Interpersonal problems

Eighteen trials reported continuous data on interpersonal problems (Amianto 2011; Bateman 1999; Bateman 2009; Blum 2008; Bos 2010; Carter 2010; Davidson 2006; Farrell 2009; Gratz 2014; Jørgensen 2013; Kramer 2016; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Philips 2018; Reneses 2013; Salzer 2014; Soler 2009).

Generally, psychotherapy improved interpersonal problems at end of treatment compared with TAU (SMD −0.42, 95% CI −0.68 to −0.16; 18 trials, 1159 participants; I^2 = 77%; P = 0.002; Analysis 1.13.1).

Generally, psychotherapy did not improve interpersonal problems at zero to six months follow-up compared with TAU (SMD −0.41, 95% CI −1.01 to 0.20; 1 trial, 53 participants; P = 0.19; MD −0.30, 95% CI −0.76 to 0.16; 1 trial, 53 participants; P = 0.20; Analysis 1.13.2).

Generally, psychotherapy did not improve interpersonal problems at six to 12 months follow-up compared with TAU (SMD −0.17, 95% CI −0.65 to 0.32; 1 trial, 132 participants; I^2 = 39%; P = 0.50; Analysis 1.13.3).

Generally, psychotherapy did not improve interpersonal problems at above 12 months follow-up compared with TAU (SMD 0.00, 95% CI −0.54 to 0.54; 2 trials, 172 participants; I^2 = 65%; P = 1.00; Analysis 1.13.4).

1.14 Abandonment

Two trials reported continuous data on abandonment (Amianto 2011; Leppänen 2016).

Generally, psychotherapy did not improve abandonment at end of treatment compared with TAU (SMD −0.22, 95% CI −0.66 to 0.21; 2 trials, 84 participants; I^2 = 0%; P = 0.32; Analysis 1.14.1).

Generally, psychotherapy did not improve abandonment at six to 12 months follow-up compared with TAU (SMD −0.39, 95% CI −1.08 to 0.30; 1 trial, 33 participants; P = 0.27; MD -−0.39, 95% CI −1.08 to 0.30; 1 trial, 33 participants; P = 0.25; Analysis 1.14.2).

No data were available for zero to six months and above 12 months follow-up.

1.15 Identity disturbance

Four trials reported continuous data on identity disturbance (Amianto 2011; Leichsenring 2016; Leppänen 2016; Reneses 2013).

Generally, psychotherapy did not improve identity disturbance at end of treatment compared with TAU (SMD −0.37, 95% CI −0.84 to 0.10; 4 trials, 250 participants; I^2 = 65%; P = 0.12; Analysis 1.15.1).

Generally, psychotherapy improved identity disturbance at six to 12 months follow-up compared with TAU (SMD −1.09, 95% CI −1.83 to −0.35; 1 trial, 33 participants; P = 0.004; MD −1.40, 95% CI −2.25 to −0.55; 1 trial, 33 participants; P = 0.001; Analysis 1.15.2).

No data were available for zero to six months and above 12 months follow-up.

1.16 Dissociation and psychotic-like symptoms

Six trials reported continuous data on dissociation and psychotic-like symptoms (Amianto 2011; Blum 2008; Farrell 2009; Gleeson 2012; Gregory 2008b; Kredlow 2017a).

Generally, psychotherapy improved dissociation and psychotic-like symptoms at end of treatment compared with TAU (SMD −0.47, 95% CI −0.85 to −0.10; 6 trials, 244 participants; I^2 = 38%; P = 0.01; Analysis 1.16.1).

Generally, psychotherapy improved dissociation and psychotic-like symptoms at zero to six months follow-up compared with TAU (SMD

0.97, 95% CI −1.69 to −0.26; 2 trials, 35 participants; I^2 = 0%; P = 0.008; Analysis 1.16.2).

Generally, psychotherapy did not improve dissociation and psychotic-like symptoms at six to 12 months follow-up compared with TAU (SMD −0.59, 95% CI −1.29 to 0.11; 1 trial, 33 participants; P = 0.10; MD −0.70, 95% CI −1.59 to 0.09; 1 trial, 33 participants; P = 0.08; Analysis 1.16.3).

Generally, psychotherapy did not improve dissociation and psychotic-like symptoms at above 12 months follow-up compared with TAU (SMD −0.01, 95% CI −0.81 to 0.79; 1 trial, 24 participants; P = 0.98; MD -−0.20, 95% CI −20.07 to 19.67; 1 trial, 24 participants; P = 0.98; Analysis 1.16.4).

1.17 Depression (continuous)

Twenty-two trials reported continuous data on depression (Andreoli 2016; Bateman 1999; Bateman 2009; Blum 2008; Borschmann 2013; Davidson 2006; Davidson 2014; Doering 2010; Gleeson 2012; Gratz 2006; Gratz 2014; Gregory 2008b; Jahangard 2012; Jørgensen 2013; Kredlow 2017a; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; McMurran 2016; Morton 2012; Reneses 2013; Zanarini 2018).

Generally, psychotherapy improved depression at end of treatment compared to TAU (SMD −0.39, 95% CI −0.61 to −0.17; 22 trials, 1568 participants; I^2 = 75%; P = 0.0006; Analysis 1.17.1; very low-quality evidence, Summary of findings 1). This corresponds to −2.45 on the Hamilton Depression Scale. The MIREDIF on this scale is 3.0 points (NICE CG90). However, the TSA analysis showed that the RIS was not reached (n = 2274), and that there was a potential risk of type 1 error (TSA adjusted confidence interval −3.34 to −1.72) (see figure 12 in Appendix 6).

Generally, psychotherapy improved depression at zero to six months follow-up compared with TAU (SMD −0.80, 95% CI −1.26 to −0.34; 4 trials, 125 participants; I^2 = 23%; P = 0.0006; Analysis 1.17.2).

Generally, psychotherapy did not improve depression at six to 12 months follow-up compared with TAU (SMD −0.40, 95% CI −0.95 to 0.16; 3 trials, 260 participants; I^2 = 77%; P = 0.16; Analysis 1.17.3).

Generally, psychotherapy improved depression at above 12 months follow-up compared with TAU (SMD −0.40, 95% CI -0.74 to −0.06; 5 trials, 311 participants; I^2 = 47%; P = 0.02; Analysis 1.17.4).

1.18 Depression (dichotomous)

One trial reported dichotomous data on depression (Rossouw 2012b).

Generally, psychotherapy did not improve depression at end of treatment compared with TAU (RR 0.71, 95% CI 0.49 to 1.03; 1 trial, 80 participants; P = 0.08; Analysis 1.18).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

1.19 Attrition

Thirty-two trials reported dichotomous data on attrition (Amianto 2011; Andreoli 2016; Bateman 1999; Bateman 2009; Borschmann 2013; Bos 2010; Carter 2010; Davidson 2006; Doering 2010; Farrell 2009; Feigenbaum 2012; Gleeson 2012; Gratz 2006; Gratz 2014; Jørgensen 2013; Koons 2001a; Kramer 2016; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Linehan 1991; Linehan 1994; Linehan 2006; Morton 2012; Philips 2018; Priebe 2012; Reneses 2013; Robinson 2016; Rossouw 2012b; Stanley 2017; Van den Bosch 2005; Zanarini 2018).

Generally, psychotherapy did not reduce attrition at end of treatment compared with TAU (RR 1.00, 95% CI 0.83 to 1.20; 32 trials, 2225 participants; I^2 = 50%; P = 0.98; Analysis 1.19.1; low-quality evidence, Summary of findings 1).

Generally, psychotherapy reduced attrition at zero to six months follow-up compared with TAU (RR 0.58, 95% CI 0.34 to 1.00; 1 trial, 60 participants; P = 0.05; Analysis 19.2.2).

No data were available for six to 12 months and above 12 months follow-up.

1.20 Non-serious adverse effects

Two trials reported dichotomous data on non-adverse effects (McMurran 2016; Stanley 2017).

There was no clear difference in the number of serious adverse effects between psychotherapy and TAU at end of treatment (RR 0.92, 95% CI 0.45 to 1.88; 2 trials, 381 participants, P = 0.81; Analysis 1.20.1; low-quality evidence, Summary of findings 1).

There was no clear difference in the number of adverse effects between psychotherapy and TAU at zero to six months follow-up (RR 1.40, 95% CI 0.06 to 30.23; 1 trial, 20 participants; P = 0.83; Analysis 1.20.2).

TAU reduced adverse effects compared with psychotherapy at above 12 months follow-up (RR 1.68, 95% CI 1.34 to 2.10; 1 trial, 183 participants; P < 0.001; Analysis 1.20.3).

No data were available for six to 12 months follow-up.

1.21 Serious adverse effects

Five trials reported dichotomous data on serious adverse effects (Andreoli 2016; Davidson 2014; McMurran 2016; Robinson 2016; Stanley 2017).

There was no clear difference in the number of serious adverse effects between psychotherapy and TAU at end of treatment (RR 0.86, 95% CI 0.14 to 5.09; 4 trials, 571 participants, I^2 = 46%, P = 0.86; Analysis 1.21).

No data were available for zero to six months, six to 12 months and above 12 months.

2. Acceptance and commitment therapy (ACT) versus treatment-as-usual (TAU)

2.1 Primary outcome: BPD symptom severity

One trial reported continuous data on BPD symptom severity (Morton 2012).

ACT reduced BPD symptom severity at end of treatment compared with TAU (MD −14.66, 95% CI −21.85 to −7.47; 1 trial, 41 participants; P < 0.001; Analysis 2.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available at any time point for self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcomes

2.2 Affective instability

One trial reported continuous data on affective instability (Morton 2012).

ACT reduced affective instability at end of treatment compared with TAU (MD −27.00, 95% CI −38.86 to −15.14; 1 trial, 41 participants; P < 0.001; Analysis 2.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

2.3 Depression

One trial reported continuous data on depression (Morton 2012).

ACT reduced depression at end of treatment compared with TAU (MD −8.33, 95% CI −15.65 to −1.01; 1 trial, 41 participants; P = 0.03; Analysis 2.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

2.4 Attrition

One trial reported dichotomous data on attrition (Morton 2012).

ACT did not reduce attrition at end of treatment compared with TAU (RR 1.11, 95% CI 0.45 to 2.74; 1 trial, 41 participants; P = 0.82; Analysis 2.4).

No data were available for zero to months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, chronic feelings of emptiness, impulsivity, interpersonal problems, identity disturbance, dissociation and psychotic-like symptoms and adverse effects.

3. Dialectical behaviour therapy (DBT) versus treatment-as-usual (TAU)

Primary outcomes

3.1 BPD symptom severity

Three trials reported continuous data on BPD symptom severity (Koons 2001a; Priebe 2012; Soler 2009).

DBT reduced BPD symptom severity at end of treatment compared with TAU (SMD −0.60, 95% CI −1.05 to −0.14; 3 trials, 149 participants; I^2 = 42%; P = 0.01; Analysis 3.1; low-quality evidence, Summary of findings 3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.2 Self-harm

Seven trials reported continuous data on self-harm (Carter 2010; Feigenbaum 2012; Koons 2001a; Linehan 1991; Linehan 2006; Priebe 2012; Van den Bosch 2005).

DBT reduced self-harm at end of treatment compared with TAU (SMD −0.28, 95% CI −0.48 to −0.07; 7 trials, 376 participants; I^2 = 0%; P = 0.008; Analysis 3.2.1; low-quality evidence, Summary of findings 3).

DBT did not reduce self-harm at six to 12 months follow-up compared with TAU (SMD −0.26, 95% CI −0.59 to 0.07; 2 trials, 141 participants; I^2 = 0%; P = 0.13; Analysis 3.2.2).

No data were available for zero to six months and above 12 months follow-up.

3.3 Suicide-related outcomes

Five trials reported continuous data on suicide-related outcomes (Feigenbaum 2012; Koons 2001a; Linehan 2006; Mehlum 2014; Soler 2009).

DBT did not reduce suicide-related outcomes at end of treatment compared with TAU (SMD −0.23, 95% CI −0.68 to 0.23; 5 trials, 231 participants; I^2 = 58%; P = 0.33; Analysis 3.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.4 Suicide-related outcomes, attempts

One trial reported dichotomous data on suicide-related outcomes (Stanley 2017).

DBT did not reduce suicide-related outcomes at end of treatment compared with TAU (RR 0.51, 95% CI 0.14 to 1.90; 1 trial, 75 participants; P = 0.32; Analysis 3.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.5 Psychosocial functioning

Six trials reported continuous data on psychosocial functioning (Carter 2010; Feigenbaum 2012; Kramer 2016; Linehan 1994; Mehlum 2014; Soler 2009).

DBT improved psychosocial functioning at end of treatment compared with TAU (SMD −0.36, 95% CI −0.69 to −0.03; 6 trials, 225 participants; I^2 = 31%; P = 0.03; Analysis 3.5; low-quality evidence, Summary of findings 3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Secondary outcomes

3.6 Anger

Five trials reported continuous data on anger (Feigenbaum 2012; Koons 2001a; Linehan 1994; Linehan 2006; Soler 2009).

DBT reduced anger at end of treatment compared with TAU (SMD −0.47, 95% CI −0.86 to −0.09; 5 trials, 230 participants; I^2 = 46%; P = 0.02; Analysis 3.6.1).

DBT did not reduce anger at six to 12 months follow-up compared with TAU (SMD −0.17, 95% CI −0.62 to 0.27; 1 trial, 78 participants; P = 0.44; MD −0.10, 95% CI −0.36 to 0.16; 1 trial, 78 participants; P = 0.45; Analysis 3.6.2).

DBT did not reduce anger at above 12 months follow-up compared with TAU (SMD 0.02, 95% CI −0.42 to 0.46; 1 trial, 80 participants; P = 0.93; MD 0.01, 95% CI −0.20 to 0.22; 1 trial, 79 participants; P = 0.93; Analysis 3.6.3).

No data were available for zero to six months follow-up.

3.7 Affective instability

Two trials reported continuous data on affective instability (Bianchini 2019; Soler 2009).

DBT did not reduce affective instability at end of treatment compared with TAU (SMD −0.57, 95% CI −1.64 to 0.51; 2 trials, 80 participants; I^2 = 78%; P = 0.30; Analysis 3.7; random-effects model).

DBT reduced affective instability at end of treatment compared with TAU (SMD -0.75, 95% CI−1.21 to −0.28; 2 trials, 80 participants; I^2 = 78%; P = 0.002; analysis not shown; fixed-effect model).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.8 Chronic feelings of emptiness

One trial reported continuous data on chronic feelings of emptiness (Soler 2009).

DBT did not reduce chronic feelings of emptiness at end of treatment compared with TAU (MD −0.67, 95% CI −1.45 to 0.11; 1 trial, 59 participants; P = 0.09; Analysis 3.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.9 Impulsivity

Three trials reported continuous data on impulsivity (Bianchini 2019; Soler 2009; Van den Bosch 2005).

DBT reduced impulsivity at end of treatment compared with TAU (SMD −0.35, 95% CI −0.71 to −0.00; 3 trials, 128 participants; I^2 = 0%; P = 0.05; Analysis 3.9.1).

DBT did not reduce impulsivity at six to 12 months follow-up compared with TAU (SMD 0.30, 95% CI −0.30 to 0.90; 1 trial, 44 participants; P = 0.33; MD 0.23, 95% CI −0.24 to 0.70; 1 trial, 454 participants; P = 0.33; Van den Bosch 2005; Analysis 3.9.2).

No data were available for zero to six months and above 12 months follow-up.

3.10 Interpersonal problems

Three trials reported continuous data on interpersonal problems (Carter 2010; Kramer 2016; Soler 2009).

DBT did not reduce interpersonal problems at end of treatment compared with TAU (SMD −0.12, 95% CI −0.45 to 0.20; 3 trials, 148 participants; I^2 = 0%; P = 0.45; Analysis 3.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.11 Dissociation and psychotic-like symptoms

Four trials reported continuous data on dissociation and psychotic-like symptoms (Feigenbaum 2012; Koons 2001a; Priebe 2012; Soler 2009).

DBT reduced dissociation and psychotic-like symptoms at end of treatment compared with TAU (SMD −0.45, 95% CI −0.73 to −0.16; 4 trials, 194 participants; I^2 = 0%; P = 0.002; Analysis 3.11).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.12 Depression

Five trials reported continuous data on depression (Feigenbaum 2012; Koons 2001a; Linehan 2006; Mehlum 2014; Soler 2009).

DBT did not reduce depression at end of treatment compared with TAU (SMD −0.47, 95% CI −0.98 to 0.03; 5 trials, 219 participants; I^2 = 64%; P = 0.07; Analysis 3.12.1; random-effects model).

DBT reduced depression at end of treatment compared with TAU (SMD −0.46, 95% CI −0.73 to −0.18; 5 trials, 219 participants; I^2 = 64%; P = 0.001; analysis not shown; fixed-effect model).

DBT did not reduce depression at six to 12 months follow-up compared with TAU (SMD −0.23, 95% CI −0.67 to 0.21; 1 trial, 81 participants; P = 0.31; MD −1.80, 95% CI −5.40 to 1.80; 1 trial, 81 participants; P = 0.33; Analysis 3.12.2).

No data were available for zero to six months and above 12 months follow-up.

3.13 Attrition

Eleven trials reported dichotomous data on attrition (Carter 2010; Feigenbaum 2012; Koons 2001a; Kramer 2016; Linehan 1991; Linehan 1994; Linehan 2006; Priebe 2012; Soler 2009; Stanley 2017; Van den Bosch 2005).

DBT did not reduce attrition at end of treatment compared with TAU (RR 1.27, 95% CI 0.70 to 2.31; 10 trials, 217 participants; I^2 = 81%; P = 0.42; Analysis 3.13.1).

DBT reduced attrition at zero to six months follow-up compared with TAU (RR 0.58, 95% CI 0.34 to 1.00; 1 trial, 60 participants; P = 0.05; Analysis 3.13.2).

No data were available for six to 12 months and above 12 months follow-up.

3.14 Adverse effects

One trial reported dichotomous data on adverse effects (Stanley 2017).

There were no adverse effects at end of treatment in any of the groups (effect not estimable; 1 trial, 75 participants; Analysis 3.14).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

3.15 Serious adverse effects

One trial reported dichotomous data on serious adverse effects (Stanley 2017).

There was no clear difference in the number of serious adverse effects at end of treatment (RR 0.51, 95% CI 0.05 to 5.42; 1 trial, 75 participants; P = 0.58; Analysis 3.15).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for abandonment and identity disturbance.

4. Mentalisation-based therapy (MBT) versus treatment-as-usual (TAU)

Primary outcomes

4.1 BPD symptom severity

Six trials reported continuous data on BPD symptom severity (Bateman 1999; Jørgensen 2013; Laurenssen 2018; Philips 2018; Robinson 2016; Rossouw 2012b).

MBT did not reduce BPD symptom severity at end of treatment compared with TAU (SMD −0.13, 95% CI −0.38 to 0.11; 5 trials, 267 participants; I^2 = 0%; P = 0.28; Analysis 4.1.1).

MBT did not reduce BPD symptom severity at zero to six months follow-up compared with TAU (SMD −0.40, 95% CI −1.49 to 0.68; 1 trial, 15 participants; P = 0.47; MD −2.90, 95% CI −10.87 to 5.07; 1 trial, 15 participants; P = 0.48; Analysis 4.1.2).

Above 12 months follow-up: MBT did not reduce BPD symptom severity at above 12 months follow-up compared with TAU (SMD −0.94, 95% CI −2.58 to 0.70; 2 trials, 97 participants; I^2 = 92%; P = 0.26; Analysis 4.1.3; random-effects model).

Above 12 months follow-up: MBT reduced BPD symptom severity at above 12 months follow-up compared with TAU (SMD −0.76, 95% CI −1.22 to −0.30; 2 trials, 97 participants; I^2 = 92%; P = 0.001; analysis not shown; fixed-effect model).

No data were available for six to 12 months follow-up.

4.2 Self-harm (continuous)

One trial reported continuous data on self-harm (Philips 2018).

MBT did not reduce self-harm at end of treatment compared with TAU (MD 0.10, 95% CI −4.02 to 4.22; 1 trial, 24 participants; P = 0.96; Analysis 4.2.1).

4.3 Self-harm (dichotomous)

Three trials reported dichotomous data on self-harm (Bateman 1999; Bateman 2009; Rossouw 2012b).

MBT reduced self-harm at end of treatment compared with TAU (RR 0.62, 95% CI 0.49 to 0.80; 3 trials, 252 participants; I^2 = 7%; P = 0.0002; Analysis 4.3.1; low-quality evidence, Summary of findings 3).

MBT reduced self-harm at zero to six months follow-up compared with TAU (RR 0.14, 95% CI 0.04 to 0.56; 1 trial, 41 participants; P = 0.005; Analysis 4.3.2).

MBT reduced self-harm at six to 12 months follow-up compared with TAU (RR 0.27, 95% CI 0.10 to 0.68; 1 trial, 41 participants; P = 0.006; Analysis 4.3.3).

MBT reduced self-harm at above 12 months follow-up compared with TAU (RR 0.33, 95% CI 0.15 to 0.76; 1 trial, 41 participants; P = 0.009; Analysis 4.3.4).

4.4 Suicide-related outcomes

Three trials reported dichotomous data on suicide-related outcomes (Bateman 1999; Bateman 2009; Philips 2018).

MBT reduced suicide-related outcomes at end of treatment compared with TAU (RR 0.10, 95% CI 0.04 to 0.30; 3 trials, 218 participants; I^2 = 0%; P < 0.001; Analysis 4.4.1; low-quality evidence, Summary of findings 3).

MBT did not reduce suicide-related outcomes at zero to six months follow-up compared with TAU (RR 0.25, 95% CI 0.06 to 1.05; 1 trial, 41 participants; P = 0.06; Analysis 4.4.2).

MBT reduced suicide-related outcomes at above 12 months follow-up compared with TAU (RR 0.29, 95% CI 0.11 to 0.74; 1 trial, 41 participants; P < 0.001; Analysis 4.4.3).

No data were available for six to 12 months follow-up.

4.5 Psychosocial functioning

Three trials reported continuous data on psychosocial functioning (Bateman 1999; Bateman 2009; Jørgensen 2013).

MBT did not improve psychosocial functioning at end of treatment compared with TAU (SMD −0.54, 95% CI −1.24 to 0.16; 3 trials, 239 participants; I^2 = 83%; P = 0.13; Analysis 4.5.1; random-effects model).

MBT improved psychosocial functioning at end of treatment compared with TAU (SMD −0.53, 95% CI −0.79 to −0.27; 3 trials, 239 participants; I^2 = 83%; P < 0.0001; analysis not shown; fixed-effect model).

MBT did not improve psychosocial functioning at above 12 months follow-up compared with TAU (SMD −0.41, 95% CI −0.97 to 0.15; 2 trials, 104 participants; I^2 = 47%; P = 0.1507; Analysis 4.5.2).

No data were available for zero to six months and six to 12 months follow-up.

Secondary outcomes

4.6 Interpersonal problems

Five trials reported continuous data on interpersonal problems (Bateman 1999; Bateman 2009; Jørgensen 2013; Jørgensen 2013; Philips 2018).

MBT reduced interpersonal problems at end of treatment compared with TAU (SMD −0.68, 95% CI −1.33 to −0.02; 5 trials, 357 participants; I^2 = 87%; P = 0.04; Analysis 4.6.1).

MBT did not reduce interpersonal problems at zero to six months follow-up compared with TAU (SMD −0.41, 95% CI −1.01 to 0.20; 1 trial, 53 participants; P = 0.19; MD −0.30, 95% CI −0.76 to 0.16; 1 trial, 53 participants; P = 0.20; Analysis 4.6.2).

MBT did not reduce interpersonal problems at above 12 months follow-up compared with TAU (SMD −0.28, 95% CI −0.71 to 0.14; 2 trials, 96 participants; I^2 = 0%; P = 0.19; Analysis 4.6.3).

No data were available for six to 12 months follow-up.

4.7 Depression (continuous)

Four trials reported continuous data on depression (Bateman 1999; Bateman 2009; Jørgensen 2013; Laurenssen 2018).

MBT did not reduce depression at end of treatment compared with TAU (SMD −0.58, 95% CI −1.22 to 0.05; 4 trials, 333 participants; I^2 = 86%; P = 0.07; Analysis 4.7.1; random-effects model).

MBT reduced depression at end of treatment compared with TAU (SMD −0.38, 95% CI − 0.60 to −0.16; 4 trials, 333 participants; I^2 = 86%; P = 0.0009; analysis not shown; fixed-effect model).

MBT did not reduce depression at zero to six months follow-up compared with TAU (SMD −0.81, 95% CI −1.69 to 0.07; 2 trials, 91 participants; I^2 = 72%; P = 0.07; Analysis 4.7.2; random-effects model).

MBT reduced depression at zero to six months follow-up compared with TAU (SMD −0.76, 95% CI −1.22 to − 0.30; 2 trials, 91 participants; I^2 = 72%; P = 0.001; analysis not shown; fixed-effect model).

MBT reduced depression at six to 12 months follow-up compared with TAU (SMD −1.17, 95% CI −1.88 to −0.45; 1 trial, 37 participants; P = 0.001; MD −8.20, 95% CI -12.96 to −3.44; 1 trial, 37 participants; P = 0.0007; Analysis 4.7.3).

MBT did not reduce depression at above 12 months follow-up compared with TAU (SMD −0.72, 95% CI −1.55 to 0.10; 2 trials, 90 participants; I^2 = 68%; P = 0.08; Analysis 4.7.4; random-effects model).

MBT reduced depression at above 12 months follow-up compared with TAU (SMD −0.68, 95% CI −1.14 to − 0.22; 2 trials, 90 participants; I^2 = 68%; P = 0.004; analysis not shown; fixed-effect model).

4.8 Depression (dichotomous)

One trial reported dichotomous data on depression (Rossouw 2012b).

MBT did not reduce depression at end of treatment compared with TAU (RR 0.71, 95% CI 0.49 to 1.03; 1 trial, 80 participants; P = 0.08; Analysis 4.8.1).

No data were available for zero to six months, six to 12 months, and above 12 months follow-up.

4.9 Attrition

Seven trials reported dichotomous data on attrition (Bateman 1999; Bateman 2009; Jørgensen 2013; Laurenssen 2018; Philips 2018; Robinson 2016; Rossouw 2012b).

MBT did not reduce attrition at end of treatment compared with TAU (RR 0.99, 95% CI 0.79 to 1.25; 7 trials, 552 participants; I^2 = 0%; P = 0.96; Analysis 4.9.1).

No data were available for zero to six months, six to 12 months, and above 12 months follow-up.

4.10 Adverse effects

One trial reported dichotomous data on serious adverse effects (Robinson 2016).

There was no clear difference in terms of severe adverse effects at end of treatment (RR 3.00, 95% CI 0.13 to 71.15; 1 trial, P = 0.50; Analysis 4.10).

No data were available for zero to six months, six to 12 months, and above 12 months follow-up.

* No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, abandonment, identity disturbance, dissociation and psychotic-like symptoms.

4.11 Mentalisation-based treatment for eating disorders (MBT-ED) versus specialist supportive clinical management (SSCM-ED) (generic inverse variance)

Primary outcome: psychosocial functioning

One trial reported continuous data on psychosocial functioning (Robinson 2016).

MBT-ED did not improve psychosocial functioning at end of treatment compared with SSCM-ED (MD −0.07, 95% CI −0.86 to 0.72; 1 trial, 23 participants; P = 0.86; Analysis 4.11.1).

MBT-ED did not improve psychosocial functioning at zero to six months follow-up compared with SSCM-ED (MD −0.44, 95% CI −1.52 to 0.64; 1 trial, 15 participants; P = 0.42 Analysis 4.11.2).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm and suicide-related outcomes.

Secondary outcomes

Interpersonal problems

One trial reported continuous data on interpersonal problems (Robinson 2016).

MBT-ED did not reduce interpersonal problems at end of treatment compared with SSCM-ED (MD −0.10, 95% CI −0.89 to 0.69; 1 trial, 23 participants; P = 0.80; Analysis 4.11.3).

MBT-ED did not reduce interpersonal problems at zero to six months follow-up compared with SSCM-ED (MD −0.06, 95% CI −1.15 to 1.03; 1 trial, 15 participants; P = 0.91; Analysis 4.11.4).

No data were available for six to 12 months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (Robinson 2016).

MBT-ED did not reduce depression at end of treatment compared with SSCM-ED (MD 0.19, 95% CI −0.60 to 0.98; 1 trial, 23 participants; P = 0.64; Analysis 4.11.5).

MBT-ED did not reduce depression at zero to six months follow-up compared with SSCM-ED (MD 0.51, 95% CI −0.62 to 1.64; 1 trial, 15 participants; P = 0.38; Analysis 4.11.6).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition and adverse effects.

5. Cognitive behaviour therapy (CBT) versus treatment-as-usual (TAU)

Primary outcomes

5.1 BPD symptom severity (continuous)

One trial reported continuous data on BPD symptom severity (Kredlow 2017a).

CBT reduced BPD symptom severity at end of treatment compared with TAU (MD −3.08, 95% CI −4.99 to −1.17; 1 trial, 26 participants; P = 0.002; Analysis 5.1.1) (random-effects model analysis).

CBT did not reduce BPD symptom severity at zero to six months follow-up compared with TAU (MD −2.02, 95% CI −4.23 to 0.19; 1 trial, 26 participants; P = 0.07; Analysis 5.1.2) (fixed-effect model analysis).

No data were available for six to 12 months and above 12 months follow-up.

5.2 BPD symptom severity (dichotomous)

One trial reported dichotomous data on BPD symptom severity (Davidson 2006).

CBT did not reduce BPD symptom severity at above 12 months follow-up compared with TAU (RR 0.91, 95% CI 0.56 to 1.48; 1 trial, 76 participants; P = 0.71; Analysis 5.2).

No data were available for end of treatment, zero to six months and six to 12 months follow-up.

5.3 Self-harm (continuous)

One trial reported continuous data on self-harm (Weinberg 2006).

CBT reduced self-harm at end of treatment compared with TAU (MD −3.03, 95% CI −5.68 to −0.38; 1 trial, 28 participants; P = 0.03; Analysis 5.3.1).

CBT did not reduce self-harm at zero to six months follow-up compared with TAU (MD −4.71, 95% CI −11.60 to 2.18; 1 trial, 28 participants; P = 0.18; Analysis 5.3.2).

No data were available for six to 12 months and above 12 months follow-up.

5.4 Self-harm (dichotomous)

One trial reported dichotomous data on self-harm (Davidson 2006).

CBT did not reduce self-harm at end of treatment compared with TAU (RR 1.17, 95% CI 0.86 to 1.60; 1 trial, 99 participants; P = 0.32; Analysis 5.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

5.5 Suicide-related outcomes

Two trials reported continuous data on suicide-related outcomes (Davidson 2006; Weinberg 2006).

CBT did not reduce suicide-related outcomes at end of treatment compared with TAU (SMD −0.47, 95% CI −1.02 to 0.08; 2 trials, 104 participants; P = 0.09; Analysis 5.5.1; random-effects model).

CBT reduced suicide-related outcomes at end of treatment compared with TAU (SMD −0.42, 95% −0.81, −0.02; 2 trials, 104 participants; P = 0.04; analysis not shown; fixed-effect model).

CBT did not reduce suicide-related outcomes at zero to six months follow-up compared with TAU (SMD −0.45, 95% CI −1.20 to 0.31; 1 trial, 28 participants; P = 0.25; MD −7.73, 95% CI −20.00 to 4.54; 1 trial, 28 participants; P = 0.22; Analysis 5.5.2).

CBT did not reduce suicide-related outcomes at six to 12 months follow-up compared with TAU (SMD −0.44, 95% CI −0.89 to 0.02; 1 trial, 76 participants; P = 0.06; MD −1.16, 95% CI −2.47 to 0.15; 1 trial, 76 participants; P = 0.08; Analysis 5.5.3).

CBT did not reduce suicide-related outcomes at above 12 months follow-up compared with TAU (SMD −0.31, 95% CI −0.77 to 0.14; 1 trial, 76 participants; P = 0.18; MD −1.15, 95% CI −2.86 to 0.07; 1 trial, 76 participants; P = 0.19; Analysis 5.5.4).

5.6 Psychosocial functioning

Two trials reported continuous data on psychosocial functioning (Davidson 2006; McMurran 2016).

CBT did not improve psychosocial functioning at end of treatment compared with TAU (SMD 0.00, 95% CI −0.39 to 0.39; 1 trial, 99 participants; P = 1.00; MD 0.00, 95% CI −1.78 to 1.78; 1 trial, 99 participants; P = 1.00; Analysis 5.6.1).

CBT did not improve psychosocial functioning at six to 12 months follow-up compared with TAU (SMD 0.13, 95% CI −0.28 to 0.55; 1 trial, 90 participants; P = 0.52; MD 0.70, 95% CI −1.43 to 2.83; 1 trial, 90 participants; P = 0.52; Analysis 5.6.2).

CBT did not improve psychosocial functioning at above 12 months follow-up compared with TAU (SMD 0.04, 95% CI −0.36 to 0.43; 2 trials, 209 participants; I^2 = 51%; P = 0.86; Analysis 5.6.3.

No data were available for zero to six months follow-up.

Secondary outcomes

5.7 Interpersonal problems

One trial reported continuous data on interpersonal problems (Davidson 2006).

CBT did not reduce interpersonal problems at end of treatment compared with TAU (MD 5.40, 95% CI −3.70 to 14.50; 1 trial, 99 participants; P = 0.24; Analysis 5.7.1).

CBT did not reduce interpersonal problems at six to 12 months follow-up compared with TAU (MD 0.30, 95% CI −9.17 to 9.77; 1 trial, 99 participants; P = 0.95; Analysis 5.7.2).

TAU reduced interpersonal problems at above 12 months follow-up compared with CBT (MD 11.70, 95% CI 0.72 to 22.68; 1 trial, 76 participants; P = 0.04; Analysis 5.7.3).

No data were available for zero to six months follow-up.

5.8 Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Kredlow 2017a).

CBT did not reduce dissociation and psychotic-like symptoms at end of treatment compared with TAU (MD −2.30, 95% CI −8.84 to 4.24; 1 trial, 26 participants; P = 0.49; Analysis 5.8.1).

CBT reduced dissociation and psychotic-like symptoms at zero to six months follow-up compared with TAU (MD −13.40, 95% CI −24.49 to −2.31; 1 trial, 26 participants; P = 0.02; Analysis 5.8.2).

No data were available for six to 12 months and above 12 months follow-up.

5.9 Depression

Five trials reported continuous data on depression (Davidson 2006; Davidson 2014; Jahangard 2012; Kredlow 2017a; McMurran 2016).

CBT did not reduce depression at end of treatment compared with TAU (SMD −0.21, 95% CI −0.77 to 0.35; 5 trials, 314 participants; I^2 = 77%; P = 0.47; Analysis 5.9.1).

CBT reduced depression at zero to six months follow-up compared with TAU (SMD −0.96, 95% CI −1.78 to −0.14; 1 trial, 26 participants; P = 0.02; MD −12.70, 95% CI −22.62 to −2.78; 1 trial, 26 participants; P = 0.01; Analysis 5.9.2).

CBT did not reduce depression at six to 12 months follow-up compared with TAU (SMD −0.29, 95% CI −0.69 to 0.11; 1 trial, 99 participants; P = 0.15; MD −4.60, 95% CI −10.82 to 1.62; 1 trial, 99 participants; P = 0.15; Analysis 5.9.3).

CBT did not reduce depression at above 12 months follow-up compared with TAU (SMD −0.15, 95% CI −0.43 to 0.13; 2 trials, 197 participants; I^2 = 0%; P = 0.30; Analysis 5.9.4).

5.10 Attrition

One trial reported dichotomous data on attrition (Davidson 2006).

CBT did not reduce attrition at end of treatment compared with TAU (RR 0.48, 95% CI 0.09 to 2.52; 1 trial, 106 participants; P = 0.39; Analysis 5.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

5.11 Adverse effects

Two trials reported dichotomous data on non-serious and serious adverse effects (Davidson 2014 McMurran 2016).

There was no clear difference in the number of non-serious adverse effects at end of treatment (RR 0.92, 95% CI 0.45 to 1.88; 1 trial, 306 participants; P = 0.81; Analysis 5.11.1).

There was no clear difference in the number of serious adverse effects at end of treatment (RR 2.65, 95% CI 0.31 to 22.93; 2 trials, 326 participants; I^2= 0%, P = 0.56; Analysis 5.11.2).

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, abandonment and identity disturbance.

6. Psychodynamic psychotherapy versus treatment-as-usual (TAU)

Primary outcomes

6.1 BPD symptom severity

Four trials reported continuous data on BPD symptom severity (Amianto 2011; Gregory 2008b; Leichsenring 2016; Reneses 2013).

Psychodynamic psychotherapy did not reduce BPD symptom severity at end of treatment compared with TAU (SMD −0.29, 95% CI −0.66 to 0.09; 4 trials, 222 participants; I^2 = 38%; P = 0.13; Analysis 6.1.1).

Psychodynamic psychotherapy did not reduce BPD symptom severity at six to 12 months follow-up compared with TAU (SMD −0.31, 95% CI −1.00 to 0.38; 1 trial, 33 participants; P = 0.38; MD −0.30, 95% CI −0.95 to 0.35; 1 trial, 33 participants; P = 0.37; Analysis 6.1.2).

No data were available for zero to six months and above 12 months follow-up.

6.2 Self-harm

Two trials reported continuous data on self-harm (Amianto 2011; Gregory 2008b).

Psychodynamic psychotherapy did not reduce self-harm at end of treatment compared with TAU (MD 0.12, 95% CI −0.56 to 0.80; 1 trial, 33 participants; P = 0.73; Analysis 6.2.1).

Psychodynamic psychotherapy did not reduce self-harm at six to 12 months follow-up compared with TAU (MD 0.14, 95% CI −0.55 to 0.82; 1 trial, 33 participants; P = 0.69; Analysis 6.2.2).

No data were available for zero to six months and above 12 months follow-up.

6.3 Suicide-related outcomes

Three trials reported continuous data on suicide-related outcomes (Amianto 2011; Gregory 2008b; Reneses 2013).

Psychodynamic psychotherapy did not reduce suicide-related outcomes at end of treatment compared with TAU (SMD −0.22, 95% CI −0.62 to 0.17; 3 trials, 101 participants; I^2 = 27%; P = 0.27; Analysis 6.3.1).

Psychodynamic psychotherapy did not reduce suicide-related outcomes at six to 12 months follow-up compared with TAU (SMD −0.38, 95% CI −1.07 to 0.31; 1 trial, 33 participants; P = 0.28; MD −0.30, 95% CI −0.82 to 0.2; 1 trial, 33 participants; P = 0.26; Analysis 6.3.2).

No data were available for zero to six months and above 12 months follow-up.

6.4 Psychosocial functioning

Four trials reported continuous data on psychosocial functioning (Amianto 2011; Gregory 2008b; Reneses 2013; Salzer 2014).

Psychodynamic psychotherapy did not improve psychosocial functioning at end of treatment compared with TAU (SMD −0.69,

95% CI −1.98 to 0.59; 4 trials, 140 participants; I^2 = 92%; P = 0.29; Analysis 6.4.1; random-effects model).

Psychodynamic psychotherapy improved psychosocial functioning at end of treatment compared with TAU (SMD −0.38, 95% CI −0.75 to −0.02; 4 trials, 140 participants; I^2 = 92%; P = 0.04; analysis not shown; fixed-effect model).

Psychodynamic psychotherapy did not improve psychosocial functioning at six to 12 months follow-up compared with TAU (SMD 0.05, 95% CI −0.64 to 0.73; 1 trial, 33 participants; P = 0.89; MD 0.60, 95% CI −8.07 to 9.27; 1 trial, 33 participants; P = 0.89; Analysis 6.4.2).

Psychodynamic psychotherapy did not improve psychosocial functioning at above 12 months follow-up compared with TAU (SMD −0.40, 95% CI −1.39 to 0.60; 1 trial, 16 participants; P = 0.44; MD −3.70, 95% CI −12.37 to 4.97; 1 trial, 16 participants; P = 0.40; Analysis 6.4.3).

No data were available for zero to six months.

Secondary outcomes

6.5 Anger

One trial reported continuous data on anger (Amianto 2011).

Psychodynamic psychotherapy did not reduce anger at end of treatment compared with TAU (MD 0.00, 95% CI −0.86 to 0.86; 1 trial, 33 participants; P = 1.00; Analysis 6.5.1).

Psychodynamic psychotherapy did not reduce anger at six to 12 months follow-up compared with TAU (MD 0.00, 95% CI −0.89 to 0.89; 1 trial, 33 participants; P = 1.00; Analysis 6.5.2).

No data were available for zero to six months and above 12 months follow-up.

6.6 Affective instability

Three trials reported continuous data on affective instability (Amianto 2011; Reneses 2013; Salzer 2014).

Psychodynamic psychotherapy reduced affective instability at end of treatment compared with TAU (SMD −0.50, 95% CI −0.87 to −0.13; 3 trials, 116 participants; I^2 = 0%; P = 0.009; Analysis 6.6.1).

Psychodynamic psychotherapy did not reduce affective instability at six to 12 months follow-up compared with TAU (SMD −0.52, 95% CI −1.21 to 0.18; 1 trial, 33 participants; P = 0.15; MD −0.70, 95% CI −1.59 to 0.19; 1 trial, 33 participants; P = 0.12; Analysis 6.6.2).

No data were available for zero to six months and above 12 months follow-up.

6.7 Chronic feelings of emptiness

Two trials reported continuous data on chronic feelings of emptiness (Amianto 2011; Reneses 2013).

Psychodynamic psychotherapy did not reduce chronic feelings of emptiness at end of treatment compared with TAU (SMD −0.49, 95% CI −1.02 to 0.04; 2 trials, 77 participants; I^2 = 24%; P = 0.07; Analysis 6.7.1; random-effects model).

Psychodynamic psychotherapy reduced chronic feelings of emptiness at end of treatment compared with TAU (SMD −0.50, 95% CI −0.96 to −0.04; 2 trials, 77 participants; I^2 = 24%; P = 0.03; analysis not shown; fixed-effect model).

Psychodynamic psychotherapy did not reduce chronic feelings of emptiness at six to 12 months follow-up compared with TAU (SMD −0.58, 95% CI −1.28 to 0.11; 1 trial, 33 participants; P = 0.10; MD −0.60, 95% CI −1.29 to 0.09; 1 trial, 33 participants; P = 0.09; Analysis 6.7.2).

No data were available for six to 12 months and above 12 months follow-up.

6.8 Impulsivity

Two trials reported continuous data on impulsivity (Amianto 2011; Reneses 2013).

Psychodynamic psychotherapy did not reduce impulsivity at end of treatment compared with TAU (SMD −0.39, 95% CI −0.85 to 0.07; 2 trials, 77 participants; I^2 = 0%; P = 0.09; Analysis 6.8.1).

Psychodynamic psychotherapy did not reduce impulsivity at six to 12 months follow-up compared with TAU (SMD 0.35, 95% CI −0.34 to 1.04; 1 trial, 33 participants; P = 0.32; MD 0.20, 95% CI −0.18 to 0.58; 1 trial, 33 participants; P = 0.30; Analysis 6.8.2).

No data were available for zero to six months and above 12 months follow-up.

6.9 Interpersonal problems

Four trials reported continuous data on interpersonal problems (Amianto 2011; Leichsenring 2016; Reneses 2013; Salzer 2014).

Psychodynamic psychotherapy did not reduce interpersonal problems at end of treatment compared with TAU (SMD −0.21, 95% CI −0.71 to 0.29; 4 trials, 238 participants; I^2 = 68%; P = 0.41; Analysis 6.9.1).

Psychodynamic psychotherapy did not reduce interpersonal problems at six to 12 months follow-up compared with TAU (SMD −0.51, 95% CI −1.20 to 0.19; 1 trial, 33 participants; P = 0.15; MD −0.60, 95% CI −1.38 to 0.18; 1 trial, 33 participants; P = 0.13; Analysis 6.9.2).

No data were available for zero to six months and above 12 months follow-up.

6.10 Abandonment

One trial reported continuous data on abandonment (Amianto 2011).

Psychodynamic psychotherapy did not reduce abandonment at end of treatment compared with TAU (MD −0.20, 95% CI −0.95 to 0.55; 1 trial, 33 participants; P = 0.60; Analysis 6.10.1).

Psychodynamic psychotherapy did not reduce abandonment at six to 12 months follow-up compared with TAU (MD −0.40, 95% CI −1.08 to 0.28; 1 trial, 33 participants; P = 0.25; Analysis 6.10.2).

No data were available for zero to six months and above 12 months follow-up.

6.11 Identity disturbance

Three trials reported continuous data on identity disturbance (Amianto 2011; Leichsenring 2016; Reneses 2013).

Psychodynamic psychotherapy did not reduce identity disturbance at end of treatment compared with TAU (SMD −0.38, 95% CI −1.02 to 0.27; 3 trials, 199 participants; I^2 = 75%; P = 0.25; Analysis 6.11.1).

Psychodynamic psychotherapy reduced identity disturbance at six to 12 months follow-up compared with TAU (SMD −1.09, 95% CI −1.83 to −0.35; 1 trial, 33 participants; P = 0.004; MD −1.40, 95% CI −2.25 to −0.55; 1 trial, 33 participants; P = 0.001; Analysis 6.11.2).

No data were available for zero to six months and above 12 months follow-up.

6.12 Dissociation and psychotic-like symptoms

Two trials reported continuous data on dissociation and psychotic-like symptoms (Amianto 2011; Gregory 2008b).

Psychodynamic psychotherapy did not reduce dissociation and psychotic-like symptoms at end of treatment compared with TAU (SMD −0.18, 95% CI −0.96 to 0.60; 2 trials, 57 participants; I^2 = 53%; P = 0.66; Analysis 6.12.1).

Psychodynamic psychotherapy did not reduce dissociation and psychotic-like symptoms at six to 12 months follow-up compared with TAU (SMD −0.59, 95% CI −1.29 to 0.11; 1 trial, 33 participants; P = 0.10; MD −0.70, 95% CI −1.49 to 0.09; 1 trial, 33 participants; P = 0.08; Analysis 6.12.2).

Psychodynamic psychotherapy did not reduce dissociation and psychotic-like symptoms at above 12 months follow-up compared with TAU (SMD −0.01, 95% CI −0.81 to 0.79; 1 trial, 24 participants; P = 0.98; MD −0.20, 95% CI −20.07 to 19.67; 1 trial, 24 participants; P = 0.98; Analysis 6.12.3).

No data were available for zero to six months follow-up.

6.13 Depression

Three trials reported continuous data on depression (Amianto 2011; Leichsenring 2016; Reneses 2013).

Psychodynamic psychotherapy did not reduce depression at end of treatment compared with TAU (SMD −0.17, 95% CI −0.81 to 0.47; 3 trials, 190 participants; I^2 = 73%; P = 0.61; Analysis 6.13.1).

Psychodynamic psychotherapy did not reduce depression at above 12 months follow-up compared with TAU (SMD −0.68, 95% CI −1.51 to 0.15; 1 trial, 24 participants; P = 0.11; MD −7.80, 95% CI −16.71 to 1.11; 1 trial, 24 participants; P = 0.09; Analysis 6.13.2).

No data were available for zero to six months and six to 12 months follow-up.

6.14 Attrition

Three trials reported dichotomous data on attrition (Amianto 2011; Leichsenring 2016; Reneses 2013).

Psychodynamic psychotherapy did not reduce attrition at end of treatment compared with TAU (RR 0.90, 95% CI 0.56 to 1.47; 3 trials, 210 participants; I^2 = 0%; P = 0.68; Analysis 6.14).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for adverse effects.

7. Schema-focused therapy (SFT) versus treatment-as-usual (TAU)

Primary outcomes

7.1 BPD symptom severity

One trial reported continuous data on BPD symptom severity (Farrell 2009).

SFT reduced BPD symptom severity at end of treatment compared with TAU (MD −13.94, 95% CI −19.66 to −8.22; 1 trial, 28 participants; P < 0.001; Analysis 7.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

7.2 Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Farrell 2009).

SFT improved psychosocial functioning at end of treatment compared with TAU (MD −10.42, 95% CI −16.17 to −4.67; 1 trial, 28 participants; P < 0.001; Analysis 7.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm and suicide-related outcomes.

Secondary outcomes

7.3 Affective instability

One trial reported continuous data on affective instability (Farrell 2009).

SFT reduced affective instability at end of treatment compared with TAU (MD −3.95, 95% CI −5.75 to −2.15; 1 trial, 28 participants; P < 0.001; Analysis 7.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

7.4 Impulsivity

One trial reported continuous data on impulsivity (Farrell 2009).

SFT reduced impulsivity at end of treatment compared with TAU (MD −4.02, 95% CI −5.68 to −2.36; 1 trial, 28 participants; P < 0.001; Analysis 7.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

7.5 Interpersonal problems

One trial reported continuous data on interpersonal problems (Farrell 2009).

SFT reduced interpersonal problems at end of treatment compared with TAU (MD −7.12, 95% CI −9.65 to −4.59; 1 trial, 28 participants; P < 0.001; Analysis 7.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

7.6 Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Farrell 2009).

SFT reduced dissociation and psychotic-like symptoms at end of treatment compared with TAU (MD −2.56, 95% CI −3.86 to −1.26; 1 trial, 28 participants; P < 0.001; Analysis 7.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up..

7.7 Attrition

One trial reported dichotomous data on attrition (Farrell 2009).

SFT did not reduce attrition at end of treatment compared with TAU (RR 0.11, 95% CI 0.01 to 1.91; 1 trial, 32 participants; P = 0.13; Analysis 7.7).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

* No data were available on any time point for anger, chronic feelings of emptiness, abandonment, identity disturbance, depression, and adverse effects

8. Systems training for emotional predictability and problem solving (STEPPS) versus treatment-as-usual (TAU)

Primary outcomes

8.1 BPD symptom severity

Three trials reported continuous data on BPD symptom severity (Blum 2008; Bos 2010; Schuppert 2012).

STEPPS reduced BPD symptom severity at end of treatment compared with TAU (SMD −0.39, 95% CI −0.63 to −0.15; 3 trials, 273 participants; I^2 = 0%; P = 0.001; Analysis 8.1.1).

STEPPS did not reduce BPD symptom severity at six to 12 months follow-up compared with TAU (SMD 0.03, 95% CI −0.33 to 0.38; 1 trial, 124 participants; P = 0.88; MD 0.60, 95% CI −7.45 to 8.65; 1 trial, 124 participants; P = 0.88; Analysis 8.1.2).

No data were available for zero to six months and above 12 months follow-up.

8.2 Self-harm

One trial reported dichotomous data on self-harm (Bos 2010).

STEPPS did not reduce self-harm at end of treatment compared with TAU (RR 1.32, 95% CI 0.78 to 2.22; 1 trial, 58 participants; P = 0.30; Analysis 8.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

8.3 Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Blum 2008).

STEPPS improved psychosocial functioning at end of treatment compared with TAU (MD −7.00, 95% CI −11.43 to −2.57; 1 trial, 124 participants; P = 0.002; Analysis 8.3.1).

STEPPS did not improve psychosocial functioning at six to 12 months follow-up compared with TAU (MD −5.90, 95% CI −12.49 to 0.69; 1 trial, 124 participants; P = 0.08; Analysis 8.3.2).

No data were available for zero to six months and above 12 months follow-up.

No data were available on any time point for suicide-related outcomes.

Secondary outcomes

8.4 Affective instability

Two trials reported continuous data on affective instability (Blum 2008; Schuppert 2012).

STEPPS did not reduce affective instability at end of treatment compared with TAU (SMD −0.25, 95% CI −0.52 to 0.02; 2 trials, 221 participants; P = 0.06; Analysis 8.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

8.5 Impulsivity (continuous)

One trial reported continuous data on impulsivity (Blum 2008).

STEPPS did not reduce impulsivity at end of treatment compared with TAU (MD −0.40, 95% CI −1.23 to 0.43; 1 trial, 124 participants; P = 0.35; Analysis 8.5).

8.6 Impulsivity (dichotomous)

One trial reported dichotomous data on impulsivity (Bos 2010).

STEPPS did not reduce impulsivity at end of treatment compared with TAU (RR 0.93, 95% CI 0.66 to 1.29; 1 trial, 58 participants; P = 0.65; Analysis 8.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

8.7 Interpersonal problems

Two trials reported continuous data on interpersonal problems (Blum 2008; Bos 2010).

STEPPS reduced interpersonal problems at end of treatment compared with TAU (SMD −0.38, 95% CI −0.67 to −0.08; 2 trials, 177 participants; I^2 = 0%; P = 0.01; Analysis 8.7).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

8.8 Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Blum 2008).

STEPPS reduced dissociation and psychotic-like symptoms at end of treatment compared with TAU (MD −1.00, 95% CI −1.83 to −0.17; 1 trial, 124 participants; P = 0.02; Analysis 8.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

8.9 Depression

One trial reported continuous data on depression (Blum 2008).

STEPPS did not reduce depression at end of treatment compared with TAU (MD −3.80, 95% CI −9.34 to 1.74; 1 trial, 124 participants; P = 0.18; Analysis 8.9.1).

STEPPS did not reduce depression at six to 12 months follow-up compared with TAU (MD −0.60, 95% CI −8.42 to 9.62; 1 trial, 124 participants; P = 0.90; Analysis 8.9.2).

No data were available for zero to six months and above 12 months follow-up.

8.10 Attrition

One trial reported dichotomous data on attrition (Bos 2010).

STEPPS did not reduce attrition at end of treatment compared with TAU (RR 1.47, 95% CI 0.59 to 3.65; 1 trial, 79 participants; P = 0.41; Analysis 8.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, chronic feelings of emptiness, abandonment, identity disturbance, and adverse effects.

9. Cognitive analytic therapy (CAT) versus treatment-as-usual (TAU)

Primary outcomes

9.1 Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Gleeson 2012).

CAT did not reduce suicide-related outcomes at end of treatment compared with TAU (MD −1.40, 95% CI −4.21 to 1.41; 1 trial, 9 participants; P = 0.33; Analysis 9.1.1).

CAT did not reduce suicide-related outcomes at zero to six months follow-up compared with TAU (MD −0.50, 95% CI −2.05 to 1.05; 1 trial, 8 participants; P = 0.53; Analysis 9.1.2).

No data were available for six to 12 months and above 12 months follow-up.

9.2 Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Gleeson 2012).

CAT improved psychosocial functioning at end of treatment compared with TAU (MD −16.40, 95% CI −31.20 to −1.60; 1 trial, 9 participants; P = 0.03; Analysis 9.2.1).

CAT improved psychosocial functioning at zero to six months follow-up compared with TAU (MD −15.80, 95% CI −29.36 to −2.24; 1 trial, 9 participants; P = 0.02; Analysis 9.2.2).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, and self-harm.

Secondary outcomes

9.3 Anger

One trial reported continuous data on anger (Gleeson 2012).

CAT did not reduce anger at end of treatment compared with TAU (MD −1.90, 95% CI −7.97 to 4.17; 1 trial, 9 participants; P = 0.54; Analysis 9.3.1).

CAT did not reduce anger at zero to six months follow-up compared with TAU (MD −4.50, 95% CI −9.01 to 0.01; 1 trial, 8 participants; P = 0.05; Analysis 9.3.2).

No data were available for six to 12 months and above 12 months follow-up.

9.4 Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Gleeson 2012).

CAT did not reduce dissociation and psychotic-like symptoms at end of treatment compared with TAU (MD −6.10, 95% CI −15.01 to 2.81; 1 trial, 9 participants; P = 0.18; Analysis 9.4.1).

CAT did not reduce dissociation and psychotic-like symptoms at zero to six months follow-up compared with TAU (MD −11.70, 95% CI −24.02 to 0.62; 1 trial, 8 participants; P = 0.06; Analysis 9.4.2).

No data were available for six to 12 months and above 12 months follow-up.

9.5 Depression

One trial reported continuous data on depression (Gleeson 2012).

CAT did not reduce depression at end of treatment compared with TAU (MD −9.70, 95% CI −20.10 to 0.70; 1 trial, 9 participants; P = 0.07; Analysis 9.5.1).

CAT did not reduce depression at zero to six months follow-up compared with TAU (MD −3.70, 95% CI −11.99 to 4.59; 1 trial, 8 participants; P = 0.38; Analysis 9.5.2).

No data were available for six to 12 months and above 12 months follow-up.

9.6 Attrition

One trial reported dichotomous data on attrition (Gleeson 2012).

CAT did not reduce attrition at end of treatment compared with TAU (RR 1.33, 95% CI 0.43 to 4.13; 1 trial, 16 participants; P = 0.62; Analysis 9.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, and adverse effects.

10. Motivation feedback (MF) versus treatment-as-usual (TAU)

10.1 Primary outcome: psychosocial functioning

One trial reported continuous data on psychosocial functioning (Jochems 2015).

MF did not improve psychosocial functioning at end of treatment compared with TAU (MD −0.42, 95% CI −4.23 to 3.39; 1 trial, 43 participants; P = 0.83; Analysis 10.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm, and suicide-related outcomes.

Secondary outcomes

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition and adverse effects

11. Psychoeducation versus treatment-as-usual (TAU)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcomes

11.1 Depression

One trial reported continuous data on depression (Zanarini 2018).

Psychoeducation did not reduce depression at end of treatment compared with TAU (MD −7.03, 95% CI −14.35 to 0.29; 1 trial, 77 participants; P = 0.06; Analysis 11.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

11.2 Attrition

One trial reported continuous data on attrition (Zanarini 2018).

Psychoeducation did not reduce attrition at end of treatment compared with TAU (RR 0.49, 95% CI 0.04 to 5.60; 1 trial, 80 participants; P = 0.56; Analysis 11.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, and adverse effects

12. Transference-focused psychotherapy (TFP) versus treatment-as-usual (TAU)

Primary outcomes

12.1 BPD symptom severity

One trial reported continuous data on BPD symptom severity (Doering 2010).

TFP reduced BPD symptom severity at end of treatment compared with TAU (MD −0.84, 95% CI −1.42 to −0.26; 1 trial, 104 participants; P = 0.004; Analysis 12.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

12.2 Self-harm

One trial reported dichotomous data on self-harm (Doering 2010).

TFP did not reduce self-harm at end of treatment compared with TAU (RR 1.09, 95% CI 0.84 to 1.40; 1 trial, 104 participants; P = 0.52; Analysis 12.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

12.3 Suicide-related outcomes

One trial reported dichotomous data on suicide-related outcomes (Doering 2010).

TFP did not reduce suicide-related outcomes at end of treatment compared with TAU (RR 0.65, 95% CI 0.27 to 1.54; 1 trial, 104 participants; P = 0.33; Analysis 12.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

12.4 Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Doering 2010).

TFP did not improve psychosocial functioning at end of treatment compared with TAU (MD −2.56, 95% CI −5.43 to 0.31; 1 trial, 104 participants; P = 0.08; Analysis 12.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Secondary outcomes

12.5 Depression

One trial reported continuous data on depression (Doering 2010).

TFP did not reduce depression at end of treatment compared with TAU (MD 1.65, 95% CI −3.44 to 6.74; 1 trial, 104 participants; P = 0.52; Analysis 12.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

12.6 Attrition

One trial reported dichotomous data on attrition (Doering 2010).

TFP reduced attrition at end of treatment compared with TAU (RR 0.57, 95% CI 0.39 to 0.85; 1 trial, 104 participants; P = 0.005; Analysis 12.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, and adverse effects.

13. Once-only interventions (individual setting) versus treatment-as-usual (TAU)

Primary outcomes

13.1 Self-harm

One trial reported continuous data on self-harm (Borschmann 2013).

Once-only interventions did not reduce self-harm at end of treatment compared with TAU (MD 0.60, 95% CI −33.88 to 35.08; 1 trial, 72 participants; P = 0.97; Analysis 13.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

13.2 Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Borschmann 2013).

Once-only interventions did not improve psychosocial functioning at end of treatment compared with TAU (MD 0.25, 95% CI −3.66 to 4.16; 1 trial, 72 participants; P = 0.90; Analysis 13.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, and suicide-related outcomes.

Secondary outcomes

13.3 Depression

One trial reported continuous data on depression (Borschmann 2013).

Once-only interventions did not improve depression at end of treatment compared with TAU (MD 0.27, 95% CI −1.72 to 2.26; 1 trial, 72 participants; P = 0.79; Analysis 13.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

13.4 Attrition

One trial reported dichotomous data on attrition (Borschmann 2013).

Once-only interventions did not reduce attrition at end of treatment compared with TAU (RR 1.37, 95% CI 0.53 to 3.52; 1 trial, 88 participants; P = 0.51; Analysis 13.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, and adverse effects.

14. Eclectic treatments versus treatment-as-usual (TAU)

Primary outcomes

14.1 BPD symptom severity

Three trials reported continuous data on BPD symptom severity (Gratz 2006; Gratz 2014; Leppänen 2016).

Eclectic treatments reduced BPD symptom severity at end of treatment compared with TAU (SMD −0.90, 95% CI −1.57 to −0.23; 3 trials, 134 participants; I^2 = 67%; P = 0.008; Analysis 14.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.2 Self-harm

Two trials reported continuous data on self-harm (Gratz 2006; Gratz 2014).

Eclectic treatments reduced self-harm at end of treatment compared with TAU (SMD −0.84, 95% CI −1.29 to −0.39; 2 trials, 83 participants; I^2 = 0%; P = 0.0003; Analysis 14.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.3 Suicide-related outcomes

Two trials reported continuous data on suicide-related outcomes (Andreoli 2016; Leppänen 2016).

Eclectic treatments did not reduce suicide-related outcomes at end of treatment compared with TAU (SMD −0.55, 95% CI −1.29 to 0.19; 2 trials, 221 participants; I^2 = 78%; P = 0.14; Analysis 14.3; random-effects model).

Eclectic treatments reduced suicide-related outcomes at end of treatment compared with TAU (SMD −0.65, 95% CI −0.98 to − 0.32; 2 trials, 221 participants; I^2 = 78%; P = 0.0001; analysis not shown; fixed-effect model).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.4 Psychosocial functioning

Two trials reported continuous data on psychosocial functioning (Andreoli 2016; Gratz 2014).

Eclectic treatments improved psychosocial functioning at end of treatment compared with TAU (SMD −0.57, 95% CI −1.10 to −0.04; 2 trials, 231 participants; I^2 = 63%; P = 0.03; Analysis 14.4.1).

Eclectic treatments improved psychosocial functioning at above 12 months follow-up compared with TAU (SMD −0.64, 95% CI −1.04 to −0.24; 1 trial, 170 participants; P = 0.002; MD −7.50, 95% CI −12.30 to −2.70; 1 trial, 170 participants; P = 0.002; Analysis 14.4.2).

No data were available for zero to months and six to 12 months.

Secondary outcomes

14.5 Anger

One trial reported continuous data on anger (Leppänen 2016).

Eclectic treatments did not reduce anger at end of treatment compared with TAU (MD −0.47, 95% CI −1.26 to 0.32; 1 trial, 51 participants; P = 0.24; Analysis 14.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.6 Affective instability

Three trials reported continuous data on affective instability (Gratz 2006; Gratz 2014; Leppänen 2016).

Eclectic treatments reduced affective instability at end of treatment compared with TAU (SMD −0.95, 95% CI −1.74 to −0.15; 3 trials, 134 participants; I^2 = 76%; P = 0.02; Analysis 14.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.7 Chronic feelings of emptiness

One trial reported continuous data on chronic feelings of emptiness (Leppänen 2016).

Eclectic treatments did not reduce chronic feelings of emptiness at end of treatment compared with TAU (MD −0.59, 95% CI −2.44 to 1.26; 1 trial, 51 participants; P = 0.53; Analysis 14.7).

No data were available for zero to months, six to 12 months and above 12 months follow-up.

14.8 Impulsivity

Three trials reported continuous data on impulsivity (Gratz 2006; Gratz 2014; Leppänen 2016).

Eclectic treatments reduced impulsivity at end of treatment compared with TAU (SMD −0.76, 95% CI −1.30 to −0.22; 3 trials, 134 participants; I^2 = 52%; P = 0.006; Analysis 14.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.9 Interpersonal problems

Two trials reported continuous data on interpersonal problems (Gratz 2014; Leppänen 2016).

Eclectic treatments reduced interpersonal problems at end of treatment compared with TAU (SMD −0.62, 95% CI −1.09 to −0.15; 2 trials, 112 participants; I^2 = 32%; P = 0.01; Analysis 14.9).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.10 Abandonment

One trial reported continuous data on abandonment (Leppänen 2016).

Eclectic treatments did not reduce abandonment at end of treatment compared with TAU (MD −0.46, 95% CI −1.39 to 0.47; 1 trial, 51 participants; P = 0.33; Analysis 14.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.11 Identity disturbance

One trial reported continuous data on identity disturbance (Leppänen 2016).

Eclectic treatments did not reduce identity disturbance at end of treatment compared with TAU (MD −0.85, 95% CI −1.92 to 0.22; 1 trial, 51 participants; P = 0.12; Analysis 14.11).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.14 Depression

Four trials reported continuous data on depression (Andreoli 2016; Gratz 2006; Gratz 2014; Leppänen 2016).

Eclectic treatments reduced depression at end of treatment compared with TAU (SMD −0.82, 95% CI −1.38 to −0.26; 4 trials, 304 participants; I^2 = 73%; P = 0.004; Analysis 14.12).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.13 Attrition

Four trials reported dichotomous data on attrition (Andreoli 2016; Gratz 2006; Gratz 2014; Leppänen 2016).

Eclectic treatments did not reduce attrition at end of treatment compared with TAU (RR 1.10, 95% CI 0.91 to 1.33; 4 trials, 326 participants; I^2 = 25%; P = 0.31; Analysis 14.13).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

14.14 Adverse effects

One trial reported dichotomous data on adverse effects (Andreoli 2016).

Eclectic treatments did not reduce adverse effects at end of treatment compared with TAU (RR 0.66, 95% CI 0.03 to 15.81; 1 trial, 170 participants; P = 0.80; Analysis 14.14).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for dissociation and psychotic-like symptoms.

15. Psychotherapy versus waiting list or no treatment

Primary outcomes

15.1 BPD symptom severity

Three trials reported continuous data on BPD symptom severity (Bellino 2010; Bohus 2013; McMain 2017).

Psychotherapy reduced BPD symptom severity at end of treatment compared with waiting list (SMD −0.49, 95% CI −0.93 to −0.5; 3 trials, 161 participants; I^2 = 44%; P = 0.03; Analysis 15.1; low-quality evidence, Summary of findings 2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.2 Self-harm

Two trials reported continuous data on self-harm (Bellino 2010; McMain 2017).

Psychotherapy did not reduce self-harm at end of treatment compared with waiting list (SMD −0.17, 95% CI −0.52 to 0.18; 2 trials, 128 participants; I^2 = 0%; P = 0.34; Analysis 15.2; low-quality evidence, Summary of findings 2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.3 Suicide-related outcomes

Two trials reported continuous data on suicide-related outcomes (McMain 2017; Mohamadizadeh 2017).

Psychotherapy did not reduce suicide-related outcomes at end of treatment compared with waiting list or no treatment (SMD −5.62, 95% CI −16.39 to 5.16; 2 trials, 108 participants; I^2 = 97%; P = 0.31; Analysis 15.3; very low-quality evidence, Summary of findings 2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.4 Psychosocial functioning

Five trials reported continuous data on psychosocial functioning (Bellino 2006; Bellino 2007; Bohus 2013; Haeyen 2018; McMain 2017).

Psychotherapy improved psychosocial functioning at end of treatment compared with waiting list (SMD −0.56, 95% CI −1.01 to −0.11; 5 trials, 219 participants; I^2 = 59%; P = 0.01; Analysis 15.4.1; low-quality evidence, Summary of findings 2).

Psychotherapy improved psychosocial functioning at zero to six months follow-up compared with waiting list (SMD −0.89, 95% CI −1.65 to −0.13; 1 trial, 30 participants; P = 0.02; MD −12.39, 95% CI −22.00 to −2.78; 1 trial, 30 participants; P = 0.01; Analysis 15.4.2).

Psychotherapy improved psychosocial functioning at six to 12 months follow-up compared with waiting list (SMD −1.04, 95% CI −1.81 to −0.27; 1 trial, 30 participants; P = 0.008: MD −13.59, 95% CI −22.65 to −4.53; 1 trial, 30 participants; P = 0.003; Analysis 15.4.3).

Psychotherapy did not improve psychosocial functioning at above 12 months follow-up compared with waiting list (SMD −0.38, 95% CI −1.14 to 0.37; 1 trial, 28 participants; P = 0.32; MD −14.68, 95% CI −46.63 to 17.27; 1 trial, 28 participants; P = 0.37; Analysis 15.4.4).

Secondary outcomes

15.5 Anger

Two trials reported continuous data on anger (Bellino 2010; McMain 2017).

Psychotherapy did not reduce anger at end of treatment compared with waiting list (SMD −0.58, 95% CI −1.70 to 0.55; 2 trials, 128 participants; I^2 = 89%; P = 0.32; Analysis 15.5, random-effects model).

Psychotherapy reduced anger at end of treatment compared with waiting list (SMD −0.70, 95% CI −1.06 to −0.33; 2 trials, 128 participants; I^2 = 89%; P = 0.0002; analysis not shown; fixed-effect model).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.6 Affective instability

Two trials reported continuous data on affective instability (Bellino 2010; McMain 2017).

Psychotherapy reduced affective instability at end of treatment compared with waiting list (SMD −0.99, 95% CI −1.36 to −0.62; 2 trials, 128 participants; I^2 = 0%; P < 0.001; Analysis 15.6.1).

Psychotherapy did not reduce affective instability at zero to six months follow-up compared with waiting list (SMD −0.47, 95% CI −1.20 to 0.26; 1 trial, 30 participants; P = 0.21; MD −0.46, 95% CI −1.15 to 0.23; 1 trial, 30 participants; P = 0.19; Analysis 15.6.2).

Psychotherapy did not reduce affective instability at six to 12 months follow-up compared with waiting list (SMD −0.38, 95% CI −1.10 to 0.34; 1 trial, 30 participants; P = 0.30; MD −0.39, 95% CI −1.12 to 0.34; 1 trial, 30 participants; P = 0.29; Analysis 15.6.3).

Psychotherapy did not reduce affective instability at above 12 months follow-up compared with waiting list (SMD −0.28, 95% CI −1.01 to 0.44; 1 trial, 30 participants; P = 0.44; MD −0.34, 95% CI −1.17 to 0.49; 1 trial, 30 participants; P = 0.42; Analysis 15.6.4).

15.7 Chronic feelings of emptiness

One trial reported continuous data on chronic feelings of emptiness (Bellino 2010).

Psychotherapy did not reduce chronic feelings of emptiness at end of treatment compared with waiting list (MD 0.04, 95% CI −0.21 to 0.29; 1 trial, 44 participants; P = 0.75; Analysis 15.7).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.8 Impulsivity

Three trials reported continuous data on impulsivity (Bellino 2010; McMain 2017; Zanarini 2008).

Psychotherapy reduced impulsivity at end of treatment compared with waiting list (SMD −0.52, 95% CI −0.82 to -0.22; 3 trials, 178 participants; I^2 = 0%; P = 0.0007; Analysis 15.8.1).

Psychotherapy reduced impulsivity at zero to six months follow-up compared with waiting list (SMD −0.90, 95% CI −1.66 to −0.14; 1 trial, 30 participants; P = 0.02; MD −1.10, 95% CI −1.95 to −0.25; 1 trial, 30 participants; P = 0.01; Analysis 15.8.2).

Psychotherapy reduced impulsivity at six to 12 months follow-up compared with waiting list (SMD −0.79, 95% CI −1.54 to −0.04; 1 trial, 30 participants; P = 0.04; MD −1.10, 95% CI −2.06 to −0.14; 1 trial, 30 participants; P = 0.02; Analysis 15.8.3).

Psychotherapy reduced impulsivity at above 12 months follow-up compared with waiting list (SMD −0.75, 95% CI −1.50 to −0.01; 1 trial,

30 participants; P = 0.05; MD −1.09, 95% CI −2.09 to -0.09; 1 trial, 30 participants; P = 0.03; Analysis 15.8.4).

15.9 Interpersonal problems

Three trials reported continuous data on interpersonal problems (Bellino 2010; Haeyen 2018; Zanarini 2008).

Psychotherapy reduced interpersonal problems at end of treatment compared with waiting list (SMD −0.85, 95% CI −1.23 to −0.47; 3 trials, 120 participants; I^2 = 0%; P < 0.001; Analysis 15.9.1).

Psychotherapy reduced interpersonal problems at zero to six months follow-up compared with waiting list (SMD −1.40, 95% CI −2.21 to −0.59; 1 trial, 30 participants; P = 0.0007; MD −2.00, 95% CI −2.98 to −1.02; 1 trial, 30 participants; P < 0.001; Analysis 15.9.2).

Psychotherapy reduced interpersonal problems at six to 12 months follow-up compared with waiting list (SMD −0.90, 95% CI −1.66 to −0.14; 1 trial, 30 participants; P = 0.02; MD −1.56, 95% CI −2.74 to −0.38; 1 trial, 30 participants; P = 0.009; Analysis 15.9.3).

Psychotherapy reduced interpersonal problems at above 12 months follow-up compared with waiting list (SMD −0.86, 95% CI −1.62 to −0.11; 1 trial, 30 participants; P = 0.02; MD −1.48, 95% CI −2.63 to −0.33; 1 trial, 30 participants; P = 0.01; Analysis 15.9.4).

15.10 Abandonment

One trial reported continuous data on abandonment (Bellino 2010).

Psychotherapy did not reduce abandonment at end of treatment compared with waiting list (MD 0.01, 95% CI −0.90 to 0.92; 1 trial, 44 participants; P = 0.98; Analysis 15.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.11 Identity disturbance

One trial reported continuous data on identity disturbance (Bellino 2010).

Psychotherapy did not reduce identity disturbance at end of treatment compared with waiting list (MD −0.03, 95% CI −0.56 to 0.50; 1 trial, 44 participants; P = 0.91; Analysis 15.11).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.12 Dissociation and psychotic-like

Two trials reported continuous data on dissociation and psychotic-like symptoms (Bellino 2010; Bohus 2013).

Psychotherapy did not reduce dissociation and psychotic-like symptoms at end of treatment compared with waiting list (SMD −0.13, 95% CI −0.65 to 0.39; 2 trials, 77 participants; I^2 = 24%; P = 0.62; Analysis 15.12).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.13 Depression

Six trials reported continuous data on depression (Bellino 2006; Bellino 2007; Bohus 2013; McMain 2017; Mohamadizadeh 2017; Smith 2012).

Psychotherapy reduced depression at end of treatment compared with waiting list or no treatment (SMD −1.28, 95% CI −2.21 to −0.34; 6 trials, 239 participants; I^2 = 89%; P = 0.007; Analysis 15.13; low-quality evidence, Summary of findings 2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

15.14 Attrition

Three trials reported dichotomous data on attrition (Bellino 2006; Bellino 2010; Zanarini 2008).

Psychotherapy did not reduce attrition at end of treatment compared with waiting list (RR 0.55, 95% CI 0.20 to 1.50; 3 trials, 144 participants; I^2 = 0%; P = 0.24; Analysis 15.14; very low-quality evidence, Summary of findings 2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for adverse effects.

16. Dialectical behaviour therapy (DBT) versus waiting list or no treatment

Primary outcomes

16.1 BPD symptom severity

Two trials reported continuous data on BPD symptom severity (Bohus 2013; McMain 2017).

DBT reduced BPD symptom severity at end of treatment compared with waiting list (SMD −0.71, 95% CI −1.08 to −0.33; 2 trials, 117 participants; I^2 = 0%; P = 0.0002; Analysis 16.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.2 Self-harm

One trial reported continuous data on self-harm (McMain 2017).

DBT did not reduce self-harm at end of treatment compared with waiting list (MD −1.45, 95% CI −3.76 to 0.86; 1 trial, 84 participants; P = 0.22; Analysis 16.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.3 Suicide-related outcomes

Two trials reported continuous data on suicide-related outcomes (McMain 2017; Mohamadizadeh 2017).

Psychotherapy did not reduce suicide-related outcomes at end of treatment compared with waiting list or no treatment (SMD −5.62, 95% CI −16.39 to 5.16; 2 trials, 108 participants; I^2 = 97%; P = 0.30; Analysis 16.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.4 Psychosocial functioning

Two trials reported continuous data on psychosocial functioning (Bohus 2013; McMain 2017).

DBT reduced psychosocial functioning at end of treatment compared with waiting list (SMD −0.73, 95% CI −1.11 to −0.36; 2 trials, 117 participants; I^2 = 0%; P = 0.0001; Analysis 16.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Secondary outcomes

16.5 Anger

One trial reported continuous data on anger (McMain 2017).

DBT reduced anger at end of treatment compared with waiting list (MD −11.45, 95% CI −15.73 to −7.17; 1 trial, 84 participants; P < 0.001; Analysis 16.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.6 Affective instability

One trial reported continuous data on affective instability (McMain 2017).

DBT reduced affective instability at end of treatment compared with waiting list (MD −20.15, 95% CI −28.49 to −11.81; 1 trial, 84 participants; P < 0.001; Analysis 16.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.7 Impulsivity

One trial reported continuous data on impulsivity (McMain 2017).

DBT did not reduce impulsivity at end of treatment compared with waiting list (MD −3.41, 95% CI −7.32 to 0.50; 1 trial, 84 participants; P = 0.09; Analysis 16.7).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.8 Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Bohus 2013).

DBT did not reduce dissociation and psychotic-like symptoms at end of treatment compared with waiting list (MD −6.45, 95% CI −16.51 to 3.61; 1 trial, 33 participants; P = 0.21; Analysis 16.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

16.9 Depression

Three trials reported continuous data on depression (Bohus 2013; McMain 2017; Mohamadizadeh 2017).

DBT reduced depression at end of treatment compared with waiting list or no treatment (SMD −3.20, 95% CI −5.57 to −0.83; 3 trials, 141 participants; P = 0.008; Analysis 16.9).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for chronic feelings of emptiness, interpersonal problems, abandonment, identity disturbance, attrition and adverse effects.

16.10. DBT couple therapy (CDBT) versus waiting list (generic inverse variance)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (Kamalabadi 2012).

End of treatment: CDBT reduced BPD symptom severity at end of treatment compared with waiting list (MD −27.15, 95% CI −31.59 to −22.71; 1 trial, 30 participants; P < 0.001; Analysis 16.10.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Kamalabadi 2012).

CDBT reduced suicide-related outcomes at end of treatment compared with waiting list (MD −0.94, 95% CI −1.24 to −0.64; 1 trial, 30 participants; P < 0.001; Analysis 16.10.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Kamalabadi 2012).

CDBT improved psychosocial functioning at end of treatment compared with waiting list (MD −10.70, 95% CI −12.31 to −9.09; 1 trial, 30 participants; P < 0.001; Analysis 16.10.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm.

Secondary outcomes

Anger

One trial reported continuous data on anger (Kamalabadi 2012).

CDBT reduced anger at end of treatment compared with waiting list (MD −1.42, 95% CI −1.72 to −1.12; 1 trial, 30 participants; P < 0.001; Analysis 16.10.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Affective instability

One trial reported continuous data on affective instability (Kamalabadi 2012).

CDBT reduced affective instability at end of treatment compared with waiting list (MD −4.01, 95% CI −5.44 to −2.58; 1 trial, 30 participants; P < 0.001; Analysis 16.10.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Chronic feelings of emptiness

One trial reported continuous data on chronic feelings of emptiness (Kamalabadi 2012).

CDBT reduced chronic feelings of emptiness at end of treatment compared with waiting list (MD −3.54, 95% CI −4.81 to −2.27; 1 trial, 30 participants; P < 0.001; Analysis 16.10.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Impulsivity

One trial reported continuous data on impulsivity (Kamalabadi 2012).

CDBT reduced impulsivity at end of treatment compared with waiting list (MD −0.51, 95% CI −0.72 to −0.30; 1 trial, 30 participants; P < 0.001; Analysis 16.10.7).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Interpersonal problems

One trial reported continuous data on interpersonal problems (Kamalabadi 2012).

CDBT reduced interpersonal problems at end of treatment compared with waiting list (MD −1.98, 95% CI −2.47 to −1.49; 1 trial, 30 participants;, P < 0.001; Analysis 16.10.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Abandonment

One trial reported continuous data on abandonment (Kamalabadi 2012).

CDBT reduced abandonment at end of treatment compared with waiting list (MD −0.86, 95% CI −1.09 to -0.63; 1 trial, 30 participants; P < 0.001; Analysis 16.10.9).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Identity disturbance

One trial reported continuous data on identity disturbance (Kamalabadi 2012).

CDBT reduced identity disturbance at end of treatment compared with waiting list (MD −2.44, 95% CI −2.77 to −2.11; 1 trial, 30 participants; P < 0.001; Analysis 16.10.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Kamalabadi 2012).

CDBT reduced dissociation or psychotic-like symptoms at end of treatment compared with waiting list (MD −1.92, 95% CI −2.46 to −1.38; 1 trial, 30 participants; P < 0.001; Analysis 16.10.11).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (Kamalabadi 2012).

CDBT reduced depression at end of treatment compared with waiting list (MD −10.43, 95% CI −11.86 to −9.00; 1 trial, number of participants = 30, P < 0.001; Analysis 16.10.12).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for attrition and adverse effects.

17. Schema-focused therapy (SFT) versus no treatment

17.1 Primary outcome: suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Mohamadizadeh 2017).

SFT reduced suicide-related outcomes at end of treatment compared with no treatment (MD −16.67, 95% CI −17.70 to −15.64; 1 trial, 24 participants; P < 0.001; Analysis 17.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm, and psychosocial functioning.

17.2 Secondary outcome: depression

One trial reported continuous data on depression (Mohamadizadeh 2017).

SFT reduced depression at end of treatment compared with no treatment (MD −33.92, 95% CI −35.40 to −32.44; 1 trial, 24 participants; P < 0.001; Analysis 17.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition and adverse effects.

18. Interpersonal psychotherapy (IPT) versus waiting list

Primary outcomes

18.1 BPD symptom severity

One trial reported continuous data on BPD symptom severity (Bellino 2010).

IPT did not reduce BPD symptom severity at end of treatment compared with waiting list (MD −0.19, 95% CI −3.71 to 3.33; 1 trial, 44 participants; P = 0.92; Analysis 18.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.2 Self-harm

One trial reported continuous data on self-harm (Bellino 2010).

IPT did not reduce self-harm at end of treatment compared with waiting list (MD 0.03, 95% CI −1.09 to 1.15; 1 trial, 44 participants; P = 0.96; Analysis 18.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.3 Psychosocial functioning

Two trials reported continuous data on psychosocial functioning (Bellino 2006; Bellino 2010).

IPT did not improve psychosocial functioning at end of treatment compared with waiting list (SMD −0.03, 95% CI −0.48 to 0.42; 2 trials, 76 participants; I^2 = 0%; P = 0.91; Analysis 18.3.1).

IPT improved psychosocial functioning at zero to six months follow-up compared with waiting list (SMD −0.89, 95% CI −1.65 to −0.13; 1 trial, 30 participants; P = 0.02; MD −12.39, 95% CI −22.00 to −2.78; 1 trial, 30 participants; P = 0.01; Analysis 18.3.2).

IPT improved psychosocial functioning at six to 12 months follow-up compared with waiting list (SMD −1.04, 95% CI −1.81 to −0.27; 1 trial, 30 participants; P = 0.008; MD −13.59, 95% CI −22.65 to −4.53; 1 trial, 30 participants; P = 0.003; Analysis 18.3.3).

IPT did not improve psychosocial functioning at above 12 months follow-up compared with waiting list (SMD −0.38, 95% CI −1.14 to 0.37; 1 trial, 30 participants; P = 0.32; MD −14.68, 95% CI −46.63 to 17.27; 1 trial, 30 participants; P = 0.37; Analysis 18.3.4).

No data were available on any time point for suicide-related outcomes.

Secondary outcomes

18.4 Anger

One trial reported continuous data on anger (Bellino 2010).

IPT did not reduce anger at end of treatment compared with waiting list (MD 0.01, 95% CI −0.40 to 0.42; 1 trial, 44 participants; P = 0.96; Analysis 18.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.5 Affective instability

One trial reported continuous data on affective instability (Bellino 2010).

IPT reduced affective instability at end of treatment compared with waiting list (MD −1.02, 95% CI −1.66 to −0.38; 1 trial, 44 participants; P = 0.002; Analysis 18.5.1).

IPT did not reduce affective instability at zero to six months follow-up compared with waiting list (MD −0.46, 95% CI −1.15 to 0.23; 1 trial, 30 participants; P = 0.19; Analysis 18.5.2).

IPT did not reduce affective instability at six to 12 months follow-up compared with waiting list (MD −0.39, 95% CI −1.12 to 0.34; 1 trial, 30 participants; P = 0.29; Analysis 18.5.3).

IPT did not reduce affective instability at above 12 months follow-up compared with waiting list (MD −0.34, 95% CI −1.17 to 0.49; 1 trial, 30 participants; P = 0.42; Analysis 18.5.4).

18.6 Chronic feelings of emptiness

One trial reported continuous data on chronic feelings of emptiness (Bellino 2010).

IPT did not reduce chronic feelings of emptiness at end of treatment compared with waiting list (MD 0.04, 95% CI −0.21 to 0.29; 1 trial, 44 participants; P = 0.75; Analysis 18.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.7 Impulsivity

One trial reported continuous data on impulsivity (Bellino 2010).

IPT reduced impulsivity at end of treatment compared with waiting list (MD −1.03, 95% CI −1.69 to −0.37; 1 trial, 44 participants; P = 0.002; Analysis 18.7.1).

IPT reduced impulsivity at zero to six months follow-up compared with waiting list (MD −1.10, 95% CI −1.95 to −0.25; 1 trial, 30 participants; P = 0.01; Analysis 18.7.2).

IPT reduced impulsivity at six to 12 months compared with waiting list (MD −1.10, 95% CI −2.06 to −0.14; 1 trial, 30 participants; P = 0.02; Analysis 18.7.3).

IPT reduced impulsivity at above 12 months follow-up compared with waiting list (MD −1.09, 95% CI −2.09 to −0.09; 1 trial, 30 participants; P = 0.03; Analysis 18.7.4).

18.8 Interpersonal problems

One trial reported continuous data on interpersonal problems (Bellino 2010).

IPT reduced interpersonal problems at end of treatment compared with waiting list (MD −1.14, 95% CI −1.94 to −0.34; 1 trial, 44 participants; P = 0.005; Analysis 18.8.1).

IPT reduced interpersonal problems at zero to six months follow-up compared with waiting list (MD −2.00, 95% CI −2.98 to −1.02; 1 trial, 30 participants; P < 0.001; Analysis 18.8.2).

IPT reduced interpersonal problems at six to 12 months follow-up compared with waiting list (MD −1.56, 95% CI −2.74 to −0.38; 1 trial, 30 participants; P = 0.009; Analysis 18.8.3).

IPT reduced interpersonal problems above 12 months follow-up compared with waiting list (MD −1.48, 95% CI −2.63 to −0.33; 1 trial, 30 participants; P = 0.01; Analysis 18.8.4).

18.9 Abandonment

One trial reported continuous data on abandonment (Bellino 2010).

IPT did not reduce abandonment at end of treatment compared with waiting list (MD 0.01, 95% CI −0.90 to 0.92; 1 trial, 44 participants; P = 0.98; Analysis 18.9).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.10 Identity disturbance

One trial reported continuous data on identity disturbance (Bellino 2010).

IPT did not reduce identity disturbance at end of treatment compared with waiting list (MD −0.03, 95% CI −0.56 to 0.50; 1 trial, 44 participants; P = 0.91; Analysis 18.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.11 Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Bellino 2010).

IPT did not reduce dissociation and psychotic-like symptoms at end of treatment compared with waiting list (MD 0.23, 95% CI −1.06 to 1.52; 1 trial, 44 participants; P = 0.73; Analysis 18.11).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.12 Depression

Three trials reported continuous data on depression (Bellino 2006; Bellino 2010; Smith 2012).

IPT did not reduce depression at end of treatment compared with waiting list (SMD −0.52, 95% CI −1.11 to 0.06; 3 trials, 98 participants; P = 0.08; Analysis 18.12; random-effects model).

IPT reduced depression at end of treatment compared with waiting list (SMD −0.46, 95% CI − 0.88 to −0.05; 3 trials, 98 participants; P = 0.03; analysis not shown; fixed-effect model).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

18.13 Attrition

Two trials reported dichotomous data on attrition (Bellino 2006; Bellino 2010).

IPT did not reduce attrition at end of treatment compared with waiting list (RR 0.55, 95% CI 0.20 to 1.50; 2 trials, 94 participants; P = 0.24; Analysis 18.13).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for adverse effects.

19. Once-only interventions (individual setting) versus waiting list

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcomes

19.1 Impulsivity

One trial reported continuous data on impulsivity (Zanarini 2008).

Once-only interventions did not reduce impulsivity at end of treatment compared with waiting list (MD −0.48, 95% CI −1.07 to 0.11; 1 trial, 50 participants; P = 0.11; Analysis 19.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

19.2 Interpersonal problems

One trial reported continuous data on interpersonal problems (Zanarini 2008).

Once-only interventions reduced interpersonal problems at end of treatment compared with waiting list (MD −0.88, 95% CI −1.59 to −0.17; 1 trial, 50 participants; P = 0.02; Analysis 19.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

19.3 Attrition

One trial reported dichotomous data on attrition (Zanarini 2008).

There was no attrition at end of treatment in any of the groups (effect not estimable; one trial, 50 participants; Analysis 19.3).

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression and adverse effects.

20. Eclectic treatments versus waiting list

20.1 Primary outcome: psychosocial functioning

One trial reported continuous data on psychosocial functioning (Haeyen 2018).

Eclectic treatments improved psychosocial functioning at end of treatment compared with waiting list (MD −18.64, 95% CI −30.06 to −7.22; 1 trial, 16 participants; P = 0.001; Analysis 20.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm, and suicide-related outcomes.

20.2 Secondary outcome: interpersonal problems

One trial reported continuous data on interpersonal problems (Haeyen 2018).

Eclectic treatments reduced interpersonal problems at end of treatment compared with waiting list (MD −4.89, 95% CI −8.49 to −1.29; 1 trial, 16 participants; P = 0.008; Analysis 20.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity,

abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition and adverse effects.

21. Dialectical behaviour therapy (DBT) and related treatments versus active treatment

21.1 Standard DBT (DBT) versus client-centred therapy (CCT) (continuous)

Primary outcomes

Self-harm

One trial reported continuous data on self-harm (Turner 2000).

DBT reduced self-harm at end of treatment compared with CCT (MD −2.75, 95% CI −4.42 to −1.08; 1 trial, 24 participants; P = 0.001; Analysis 21.1.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Turner 2000).

DBT reduced suicide-related outcomes at end of treatment compared with CCT (MD −7.75, 95% CI −14.66 to −0.84; 1 trial, 24 participants; P = 0.03; Analysis 21.1.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity and psychosocial functioning.

Secondary outcomes

Anger

One trial reported continuous data on anger (Turner 2000).

DBT reduced anger at end of treatment compared with CCT (MD −1.00, 95% CI −1.98 to −0.02; 1 trial, 24 participants; P = 0.05, Analysis 21.1.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Impulsivity

One trial reported continuous data on impulsivity (Turner 2000).

DBT reduced impulsivity at end of treatment compared with CCT (MD −1.50, 95% CI −2.60 to −0.40; 1 trial, 24 participants; P = 0.008; Analysis 21.1.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Turner 2000).

DBT reduced dissociation and psychotic-like symptoms at end of treatment compared with CCT (MD −7.16, 95% CI −12.15 to −2.17; 1 trial, 24 participants; P = 0.005; Analysis 21.1.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (Turner 2000).

DBT reduced depression at end of treatment compared with CCT (MD −9.16, 95% CI −14.79 to −3.53; 1 trial, 24 participants; P = 0.001; Analysis 21.1.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for affective instability, chronic feelings of emptiness, interpersonal problems, abandonment, identity disturbance, attrition, and adverse effects.

21.2 DBT versus CCT (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Turner 2000).

DBT did not reduce attrition at end of treatment compared with CCT (RR 0.50, 95% CI 0.16 to 1.55; 1 trial, 24 participants; P = 0.23; Analysis 21.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms. depression, and adverse effects.

21.3 Standard DBT (DBT) versus good psychiatric management (GPM) (continuous)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (McMain 2009).

DBT did not reduce BPD symptom severity at end of treatment compared with GPM (MD −0.23, 95% CI −1.97 to 1.51; 1 trial, 180 participants; P = 0.80; Analysis 21.3.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Self-harm

One trial reported continuous data on self-harm (McMain 2009).

DBT did not reduce self-harm at end of treatment compared with GPM (MD −8.58, 95% CI −19.38 to 2.22; 1 trial, 180 participants; P = 0.12; Analysis 21.3.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for suicide-related outcomes and psychosocial functioning.

Secondary outcomes

Anger

One trial reported continuous data on anger (McMain 2009).

DBT did not reduce anger at end of treatment compared with GPM (MD −0.15, 95% CI −1.65 to 1.35; 1 trial, 180 participants; P = 0.85; Analysis 21.3.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Interpersonal problems

One trial reported continuous data on interpersonal problems (McMain 2009).

DBT did not reduce interpersonal problems at end of treatment compared with GPM (MD −1.34, 95% CI −15.36 to 12.68; 1 trial, 180 participants; P = 0.85; Analysis 21.3.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (McMain 2009).

DBT did not reduce depression at end of treatment compared with GPM (MD −2.65, 95% CI −7.18 to 1.88; 1 trial, 180 participants; P = 0.25; Analysis 21.3.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for affective instability, chronic feelings of emptiness, impulsivity, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

21.4 DBT versus GPM (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (McMain 2009).

DBT did not reduce attrition at end of treatment compared with GPM (RR 1.03, 95% CI 0.71 to 1.49; 1 trial, 180 participants; P = 0.88; Analysis 21.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.5 Standard DBT (DBT) versus individual DBT therapy + activities group (DBT-I) (continuous)

Primary outcomes

Self-harm

One trial reported continuous data on self-harm (Linehan 2015a).

DBT did not reduce self-harm at end of treatment compared with DBT-I (MD −10.40, 95% CI −22.99 to 2.19; 1 trial, 66 participants; P = 0.11; Analysis 21.5.1).

DBT did not reduce self-harm at six to 12 months compared with DBT-I (MD −8.10, 95% CI −19.59 to 3.39; 1 trial, 66 participants; P = 0.17; Analysis 21.5.2).

No data were available for zero to six months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Linehan 2015a).

DBT did not reduce suicide-related outcomes at end of treatment compared with DBT-I (MD 0.50, 95% CI −1.37 to 2.37; 1 trial, 66 participants; P = 0.60; Analysis 21.5.3).

DBT reduced suicide-related outcomes at six to 12 months follow-up compared with DBT-I (MD −1.60, 95% CI −2.79 to −0.41; 1 trial, 66 participants; P = 0.009; Analysis 21.5.4).

No data were available for zero to six months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity and psychosocial functioning.

Secondary outcomes: depression

One trial reported continuous data on depression (Linehan 2015a).

DBT reduced depression at end of treatment compared with DBT-I (MD −5.90, 95% CI −9.74 to −2.06; 1 trial, 66 participants; P = 0.003, Analysis 21.5.5).

DBT did not reduce depression at six to 12 months follow-up compared with DBT-I (MD 1.30, 95% CI −3.10 to 5.70; 1 trial, 66 participants; P = 0.56; Analysis 21.5.6).

No data were available for zero to six months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

21.6 DBT versus GPM (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Linehan 2015a).

DBT did not reduce attrition at end of treatment compared with DBT-I (RR 0.50, 95% CI 0.25 to 1.01; 1 trial, 66 participants; P = 0.05; Analysis 21.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.7 Standard DBT (DBT) versus skills training group + individual case management (DBT-S) (continuous)

Primary outcomes

Self-harm

One trial reported continuous data on self-harm (Linehan 2015a).

DBT did not reduce self-harm at end of treatment compared with DBT-S (MD 0.30, 95% CI −8.42 to 9.02; 1 trial, 66 participants, P = 0.95; Analysis 21.7.1).

DBT did not reduce self-harm at six to 12 months follow-up compared with DBT-S (MD −1.50, 95% CI −9.04 to 6.04, 1 trial, 66 participants; P = 0.70; Analysis 21.7.2).

No data were available for zero to six months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Linehan 2015a).

DBT did not reduce suicide-related outcomes at end of treatment compared with DBT-S (MD 0.80, 95% CI −1.06 to 2.66; 1 trial, 66 participants; P = 0.40; Analysis 21.7.3).

DBT reduced suicide-related outcomes at six to 12 months follow-up compared with DBT-S (MD 0.50, 95% CI −0.02 to 1.02; 1 trial, 66 participants; P = 0.06; Analysis 21.7.4).

No data were available for zero to six months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity and psychosocial functioning.

Secondary outcomes: depression

One trial reported continuous data on depression (Linehan 2015a).

DBT did not reduce depression at end of treatment compared with DBT-S (MD 1.90, 95% CI −1.60 to 5.40; 1 trial, 66 participants; P = 0.29; Analysis 21.7.5).

DBT did not reduce depression at six to 12 months follow-up compared with DBT-S (MD 3.30, 95% CI −0.90 to 7.50; 1 trial, 66 participants; P = 0.12; Analysis 21.7.6).

No data were available for zero to six months, and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

21.8 DBT versus DBT-S (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Linehan 2015a).

DBT did not reduce attrition at six to 12 months follow-up compared with DBT-S (RR 0.62, 95% CI 0.29 to 1.29; 1 trial, 66 participants; P = 0.20; Analysis 21.8).

No data were available for end of treatment, zero to six months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.9 Standard DBT (DBT) versus step-down DBT (DBT-SD) (continuous)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (Sinnaeve 2018).

DBT did not reduce BPD severity at end of treatment compared with DBT-SD (MD −2.83, 95% CI −11.21 to 5.55; 1 trial, 38 participants; P = 0.51; Analysis 21.9.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Self-harm

One trial reported continuous data on self-harm (Sinnaeve 2018).

DBT did not reduce self-harm at end of treatment compared with DBT-SD (MD 4.10, 95% CI −4.07 to 12.27; 1 trial, 38 participants; P = 0.33; Analysis 21.9.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Sinnaeve 2018).

DBT did not reduce suicide-related outcomes at end of treatment compared with DBT-SD (MD 0.30, 95% CI −0.73 to 1.33; 1 trial, 38 participants; P = 0.57; Analysis 21.9.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for psychosocial functioning.

Secondary outcomes

Anger

One trial reported continuous data on anger (Sinnaeve 2018).

DBT did not reduce anger symptoms at end of treatment compared with DBT-SD (MD −0.53, 95% CI −1.48 to 0.43; 1 trial, 41 participants; P = 0.28; Analysis 21.9.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Affective instability

One trial reported continuous data on affective instability (Sinnaeve 2018).

DBT did not reduce affective instability at end of treatment compared with DBT-SD (MD −0.71, 95% CI −2.51 to 1.09; 1 trial, 41 participants; P = 0.44; Analysis 21.9.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Chronic feelings of emptiness

One trial reported continuous data on chronic feelings of emptiness (Sinnaeve 2018).

DBT did not reduce chronic feelings of emptiness at end of treatment compared with DBT-SD (MD 0.18, 95% CI −1.68 to 2.04; 1 trial, 41 participants; P = 0.85; Analysis 21.9.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Impulsivity

One trial reported continuous data on impulsivity (Sinnaeve 2018).

DBT did not reduce impulsivity at end of treatment compared with DBT-SD (MD 0.24, 95% CI −0.26 to 0.75; 1 trial, 41 participants; P = 0.34; Analysis 21.9.7).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Interpersonal problems

One trial reported continuous data on interpersonal problems (Sinnaeve 2018).

DBT reduced interpersonal at end of treatment problems compared with DBT-SD (MD −1.31, 95% CI −2.05 to −0.57; 1 trial, 41 participants; P = 0.005; Analysis 21.9.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Abandonment

One trial reported continuous data on abandonment (Sinnaeve 2018).

DBT reduced abandonment at end of treatment compared with DBT-SD (MD −1.11, 95% CI −2.14 to −0.08; 1 trial, 41 participants; P = 0.03; Analysis 21.9.9).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Sinnaeve 2018).

DBT did not reduce dissociation and psychotic-like symptoms at end of treatment compared with DBT-SD (MD −0.44, 95% CI −1.56 to 0.68; 1 trial, 41 participants; P = 0.44; Analysis 21.9.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for identity disturbance, depression, attrition, and adverse effects.

21.10 DBT versus DBT-SD (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Sinnaeve 2018).0.37 [0.17, 0.78]

DBT reduced attrition at end of treatment compared with DBT-SD (RR 0.37, 95% CI 0.17 to 0.78; 1 trial, 84 participants; P = 0.009; Analysis 21.10).

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.11 Standard DBT (DBT) versus DBT prolonged exposure (DBT-PE) (continuous)

Primary outcomes

Self-harm

One trial reported continuous data on self-harm (Harned 2014).

DBT did not reduce self-harm at end of treatment compared with DBT-PE (MD 0.10, 95% CI −1.86 to 2.06; 1 trial, 18 participants; P = 0.92; Analysis 21.11.1).

DBT did not reduce self-harm at zero to six months follow-up compared with DBT-PE (MD −0.30, 95% CI −1.09 to 0.49; 1 trial, 18 participants; P = 0.46; Analysis 21.11.2).

No data were available for six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Harned 2014).

There were no suicide attempts in DBT-PE group at end of treatment (effect not estimable; 1 trial, 18 participants; Analysis 21.11.3).

There were no suicide attempts in DBT group at zero to six months follow-up (effect not estimable; 1 trial, 18 participants; Analysis 21.11.4).

No data were available for six to 12 months and above 12 months follow-up.

Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Harned 2014).

DBT did not improve psychosocial functioning at end of treatment compared with DBT-PE (MD 5.27, 95% CI −2.06 to 12.60; 1 trial, 18 participants; P = 0.16, Analysis 21.11.5).

DBT did not improve psychosocial functioning at zero to six months follow-up compared with DBT-PE (MD 2.00, 95% CI −6.27 to 10.27; 1 trial, 18 participants; P = 0.64; Analysis 21.11.6).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity.

Secondary outcomes

Interpersonal problems

One trial reported continuous data on interpersonal problems (Harned 2014).

DBT did not reduce interpersonal problems at end of treatment compared with DBT-PE (MD 0.14, 95% CI −0.42 to 0.70; 1 trial, 18 participants; P = 0.62; Analysis 21.11.7).

DBT did not reduce interpersonal problems at zero to six months follow-up compared with DBT-PE (MD 0.19, 95% CI −0.48 to 0.86; 1 trial, 18 participants; P = 0.58; Analysis 21.11.8).

No data were available for six to 12 months and above 12 months follow-up.

Dissociation and psychotic-like symptoms

One trial reported continuous data on dissociation and psychotic-like symptoms (Harned 2014).

DBT did not reduce dissociation and psychotic-like symptoms at end of treatment compared with DBT-PE (MD 4.60, 95% CI −9.24 to 18.44; 1 trial, 18 participants; P = 0.51; Analysis 21.11.9).

DBT did not reduce dissociation and psychotic-like symptoms at zero to six months follow-up compared with DBT-PE (MD 6.00, 95% CI −9.46 to 21.46; 1 trial, 18 participants; P = 0.45; Analysis 21.11.10).

No data were available for six to 12 months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (Harned 2014).

DBT did not reduce depression at end of treatment compared with DBT-PE (MD 3.70, 95% CI −3.19 to 10.59; 1 trial, 18 participants; P = 0.29; Analysis 21.11.11).

DBT did not reduce depression at zero to six months follow-up compared to DBT-PE (MD 4.30, 95% CI −1.08 to 9.68; 1 trial, 18 participants; P = 0.12; Analysis 21.11.12).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, abandonment, identity disturbance, attrition, and adverse effects.

21.12 Standard DBT (DBT) versus DBT prolonged exposure (DBT-PE) (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition Harned 2014).

DBT did not reduce attrition at zero to six months follow-up compared with DBT-PE (RR 0.88, 95% CI 0.27 to 2.88; 1 trial, 28 participants; P = 0.84; Analysis 21.12).

No data were available for end of treatment, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression,and adverse effects.

21.13 DBT skills group plus case management (DBT-S) versus DBT individual therapy plus activity group (DBT-I) (continuous)

Primary outcomes

Self-harm

One trial reported continuous data on self-harm (Linehan 2015a).

DBT-S did not reduce self harm at end of treatment compared with DBT-I (MD −10.70, 95% CI −22.47 to 1.07; 1 trial, 66 participants; P = 0.07; Analysis 21.13.1).

DBT-S did not reduce self harm at six to 12 months follow-up compared with DBT-I (MD −6.60, 95% CI −19.72 to 6.52; 1 trial, 66 participants; P = 0.32; Analysis 21.13.2).

No data were available for six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Linehan 2015a).

DBT-S did not reduce suicide-related outcomes at end of treatment compared with DBT-I (MD −0.30, 95% CI −1.72 to 1.12; 1 trial, 66 participants: P = 0.68; Analysis 21.13.3).

DBT-S reduced suicide-related outcomes at six to 12 months follow-up compared with DBT-I (MD −2.10, 95% CI −3.21 to −0.99; 1 trial, 66 participants; P = 0.0002; Analysis 21.13.4).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity and psychosocial functioning.

Secondary outcomes: depression

One trial reported continuous data on depression (Linehan 2015a).

DBT-S reduced depression at end of treatment compared with DBT-I (MD −7.80, 95% CI −11.27 to −4.33; 1 trial, 66 participants; P < 0.001; Analysis 21.13.5).

DBT-S did not reduce depression at six to 12 months follow-up compared with DBT-I (MD −2.00, 95% CI −6.44 to 2.44; 1 trial, 66 participants; P = 0.38; Analysis 21.13.6).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

21.14 DBT-S versus DBT-I (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Linehan 2015a).

DBT-S did not reduce attrition at six to 12 months follow-up compared with DBT-I (RR 0.81, 95% CI 0.61 to 1.09; 1 trial, 66 participants; P = 0.17; Analysis 21.14).

No data were available for end of treatment, zero to six months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.15 DBT skills group (DBT-S) versus cognitive therapy group (CT-G) (continuous)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (Lin 2019).

DBT-S did not reduce BPD symptom severity at end of treatment compared with CT-G (MD 0.26, 95% CI −0.13 to 0.65; 1 trial, 82 participants; P = 0.19; Analysis 21.15.1).

DBT-S reduced BPD symptom severity at zero to six months follow-up compared with CT-G (MD −0.96, 95% CI −1.15 to −0.77; 1 trial, 82 participants = 82; P < 0.001; Analysis 21.15.2).

No data were available for six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Lin 2019).

DBT-S did not reduce suicide-related outcomes at end of treatment compared with CT-G (MD 0.46, 95% CI −2.47 to 3.39; 1 trial, 82 participants; P = 0.76; Analysis 21.15.3).

DBT-S reduced suicide-related outcomes at zero to six months follow-up compared with CT-G (MD −2.69, 95% CI −4.89 to −0.49; 1 trial, 82 participants; P = 0.02; Analysis 21.15.4).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm and psychosocial functioning.

Secondary outcomes: depression

One trial reported continuous data on depression (Lin 2019).

DBT-S did not reduce depression at end of treatment compared with CT-G (MD −2.12, 95% CI −5.25 to 1.01; 1 trial, 82 participants; P = 0.18, Analysis 21.15.5).

DBT-S did not reduce depression at zero to six months follow-up compared with CT-G (MD −1.60, 95% CI −5.07 to 1.87; 1 trial, 82 participants, P = 0.37 Analysis 21.15.6).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

21.16 DBT-S versus CT-G (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Lin 2019).

DBT-S did not reduce attrition at end of treatment compared with CT-G (RR 0.71, 95% CI 0.27 to 1.88; 1 trial, 82 participants; P = 0.49; Analysis 21.16).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal

problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.17 DBT skills group (DBT-S) versus schema-focused therapy group (SFT-G) (continuous)

Primary outcomes: suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Mohamadizadeh 2017).

DBT-S did not reduce suicide-related outcomes at end of treatment compared with SFT-G (MD 0.92, 95% CI −0.36 to 2.20; 1 trial, 24 participants; P = 0.16; Analysis 21.17.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm, and psychosocial functioning.

Secondary outcomes: depression

One trial reported continuous data on depression (Mohamadizadeh 2017).

SFT-G reduced depression at end of treatment compared with DBT-S (MD 4.33, 95% CI 2.57 to 6.09; 1 trial, 24 participants; P < 0.001; Analysis 21.17.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition and adverse effects.

21.18 DBT mindfulness group (DBT-M) versus DBT interpersonal effectiveness group (DBT-IE) (continuous)

Primary outcomes: BPD symptom severity

Two trials reported continuous data on BPD symptom severity (Carmona í Farrés 2019; Elices 2016).

DBT-M did not reduce BPD symptom severity at end of treatment compared with DBT-IE (SMD −0.45, 95% CI −1.47 to 0.58, 2 trials, 113 participants; I^2 = 86%; P = 0.39; Analysis 21.18.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcomes: impulsivity

Two trials reported continuous data on impulsivity (Carmona í Farrés 2019; Elices 2016).

DBT-M did not reduce impulsivity at end of treatment compared with DBT-IE (SMD −0.36, 95% CI −0.77 to 0.06; 2 trials, 91 participants; I^2 = 0%; P = 0.09; Analysis 21.18.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition, and adverse effects.

21.19 DBT-M versus DBT-IE (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

Two trials reported dichotomous data on attrition (Carmona í Farrés 2019; Elices 2016).

DBT-IE reduced attrition at end of treatment compared with DBT-M (RR 1.86, 95% CI 1.07 to 3.23; 2 trials, 134 participants; I^2 = 0%; P = 0.03; Analysis 21.19).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

21.20 DBT mindfulness group (DBT-M) versus loving-kindness and compassion mediation (LKM/CM)

Primary outcomes: BPD symptom severity

One trial reported continuous data on BPD symptom severity (Feliu-Soler 2017).

DBT-M did not reduce BPD symptom severity at end of treatment compared with LKM/CM (MD 0.04, 95% CI −0.66 to 0.74; 1 trial, 32 participants; P = 0.91; Analysis 21.20).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcomes

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition and adverse effects.

22. Cognitive behavioural therapy (CBT) and related treatments versus active treatment

22.1 CBT versus brief trauma and anxiety-related group psychoeducation (continuous)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (Kredlow 2017b).

CBT did not reduce BPD symptom severity at end of treatment compared with brief trauma and anxiety-related group

psychoeducation (MD −0.26, 95% CI −1.46 to 0.94; 1 trial, 50 participants; P = 0.67; Analysis 22.1.1).

CBT did not reduce BPD symptom severity at zero to six months follow-up compared with brief trauma and anxiety-related group psychoeducation (MD −0.39, 95% CI −1.60 to 0.82; 1 trial, 50 participants; P = 0.53; Analysis 22.1.2).

CBT did not reduce BPD symptom severity at six to 12 months follow-up compared to brief trauma and anxiety-related group psychoeducation (MD 0.57, 95% CI −0.48 to 1.62; 1 trial, number of 50 participants; P = 0.29; Analysis 22.1.3).

No data were available for above 12 months follow-up.

Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Kredlow 2017b).

CBT did not improve psychosocial functioning at end of treatment compared with brief trauma and anxiety-related group psychoeducation (MD −0.64, 95% CI −5.76 to 4.48; 1 trial, 50 participants; P = 0.81; Analysis 22.1.4).

CBT did not improve psychosocial functioning at zero to six months follow-up compared with brief trauma and anxiety-related group psychoeducation (MD −1.23, 95% CI −6.94 to 4.48; 1 trial, 50 participants; P = 0.67; Analysis 22.1.5).

CBT did not improve psychosocial functioning at six to 12 months follow-up compared with brief trauma and anxiety-related group psychoeducation (MD 0.61, 95% CI −5.00 to 6.22; 1 trial, 50 participants; P = 0.83; Analysis 22.1.6).

No data were available for above 12 months follow-up.

No data were available on any time point for self-harm and suicide-related outcomes.

Secondary outcomes: depression

One trial reported continuous data on depression (Kredlow 2017b).

CBT did not reduce depression at end of treatment compared with brief trauma and anxiety-related group psychoeducation (MD 0.76, 95% CI −8.20 to 9.72, 1 trial; 50 participants; P = 0.87; Analysis 22.1.7).

CBT did not reduce depression at zero to six months follow-up compared with brief trauma and anxiety-related group psychoeducation (MD 3.13, 95% CI −4.05 to 10.31; 1 trial, 50 participants; P = 0.39; Analysis 22.1.8).

CBT did not reduce depression at six to 12 months follow-up compared with brief trauma and anxiety-related group psychoeducation (MD 0.77, 95% CI −7.08 to 8.62; 1 trial; 50 participants; P = 0.85; Analysis 22.1.9).

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

22.2 CBT versus brief trauma and anxiety-related group psychoeducation (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Kredlow 2017b).

CBT did not reduce attrition at end of treatment compared with brief trauma and anxiety-related group psychoeducation (RR 1.99, 95% CI 0.58 to 6.82, 1 trial, 50 participants, P = 0.27; Analysis 22.2).

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

22.3 CBT versus interpersonal therapy (IPT) (continuous)

Primary outcome: psychosocial functioning

One trial reported continuous data on psychosocial functioning (Bellino 2007).

CBT did not improve psychosocial functioning at end of treatment compared with IPT (MD −5.30, 95% CI −12.36 to 1.76; 1 trial, 26 participants; P = 0.14; Analysis 22.3.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm, and suicide-related outcomes.

Secondary outcomes: depression

One trial reported continuous data on depression (Bellino 2007).

CBT did not reduce depression at end of treatment compared to IPT (MD −0.40, 95% CI −4.72 to 3.92; 1 trial, 26 participants; P = 0.86; Analysis 22.3.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition and adverse effects.

22.4 CBT versus interpersonal therapy (IPT) (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Bellino 2007).

CBT did not reduce attrition at end of treatment compared with IPT (RR 2.00, 95% CI 0.42 to 9.42; 1 trial; 32 participants; P = 0.38; Analysis 22.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

22.5 CBT versus Rogerian supportive therapy (continuous)

Primary outcomes

Self-harm

One trial reported continuous data on self-harm (Cottraux 2009).

CBT did not reduce self-harm at end of treatment compared with Rogerian support therapy (MD 0.74, 95% CI −0.03 to 1.51; 1 trial, 38 participants; P = 0.06; Analysis 22.5.1).

CBT did not reduce self-harm at six to 12 months compared with Rogerian support therapy (MD -0.63, 95% CI −1.75 to 0.49; 1 trial, 21 participants; P = 0.27; Analysis 22.5.2).

No data were available for zero to six months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Cottraux 2009).

CBT did not reduce suicide-related outcomes at end of treatment compared with Rogerian support therapy (MD 0.69, 95% CI −2.60 to 3.9; 1 trial, 38 participants; P = 0.68; Analysis 22.5.3).

CBT did not reduce suicide-related outcomes at six to 12 months compared with Rogerian support therapy (MD -2.43, 95% CI -6.14 to 1.28; 1 trial, 21 participants; P = 0.20; Analysis 22.5.4).

No data were available for zero to six months and above 12 months follow-up.

Psychosocial functioning

One trial reported continuous data on psychosocial functioning (Cottraux 2009).

CBT did not improve psychosocial functioning at end of treatment compared with Rogerian support therapy (MD −0.43, 95% CI −1.31 to 0.45; 1 trial, 38 participants; P = 0.34; Analysis 22.5.5).

CBT did not improve psychosocial functioning at six to 12 months compared with Rogerian support therapy (MD -0.98, 95% CI -2.02 to 0.06; 1 trial, 21 participants; P = 0.07; Analysis 22.5.6).

No data were available for zero to six months and above 12 months follow-up.

No data were available on any time point for BPD symptom severity.

Secondary outcomes

Impulsivity

One trial reported continuous data on Impulsivity (Cottraux 2009).

CBT did not reduce impulsivity at end of treatment compared with Rogerian support therapy (MD −1.01, 95% CI −3.85 to 1.83; 1 trial, 38 participants; P = 0.49; Analysis 22.5.7).

CBT did not reduce impulsivity at six to 12 months compared with Rogerian support therapy (MD -2.18, 95% CI -5.91 to 1.55; 1 trial, 21 participants; P = 0.25; Analysis 22.5.8).

No data were available for zero to six months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (Cottraux 2009).

CBT did not reduce depression at end of treatment compared with Rogerian support therapy (MD 1.04, 95% CI −5.59 to 7.67; 1 trial, 38 participants; P = 0.76; Analysis 22.5.9).

CBT did reduce depression at six to 12 months compared with Rogerian support therapy (MD -5.15, 95% CI -9.38 to -0.92; 1 trial, 21 participants; P = 0.02; Analysis 22.5.10).

No data were available for zero to six months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition, and adverse effects.

22.6 CBT versus Rogerian supportive therapy (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Cottraux 2009).

CBT did not reduce attrition at end of treatment compared with Rogerian support therapy (RR 0.90, 95% CI 0.51 to 1.60; 1 trial, 38 participants; P = 0.72; Analysis 22.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

22.7 MACT (manual-assisted cognitive therapy) versus MACT + therapeutic assessment (TA) (continuous)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (Morey 2010).

MACT did not reduce BPD symptom severity at end of treatment compared with MACT + TA (MD −3.75, 95% CI −14.17 to 6.67; 1 trial, 16 participants; P = 0.48; Analysis 22.7.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Self-harm

One trial reported continuous data on self-harm (Morey 2010).

MACT did not reduce self-harm at end of treatment compared with MACT + TA (MD 1.75, 95% CI −18.71 to 22.21; 1 trial, 16 participants; P = 0.87; Analysis 22.7.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Suicide-related outcomes

One trial reported continuous data on suicide-related outcomes (Morey 2010).

MACT did not reduce suicide-related outcomes at end of treatment compared with MACT + TA (MD −0.63, 95% CI −17.71 to 16.45; 1 trial, 16 participants; P = 0.94; Analysis 22.7.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for psychosocial functioning.

Secondary outcomes

Affective instability

One trial reported continuous data on affective instability (Morey 2010).

MACT did not reduce affective instability at end of treatment compared with MACT + TA (MD −5.25, 95% CI −12.10 to 1.60; 1 trial, 16 participants; P = 0.13; Analysis 22.7.4).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Interpersonal problems

One trial reported continuous data on interpersonal problems (Morey 2010).

MACT did not interpersonal problems at end of treatment compared with MACT + TA (MD −0.50, 95% CI −11.24 to 10.24; 1 trial, 16 participants; P = 0.93; Analysis 22.7.5).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Identity disturbance

One trial reported continuous data on identity disturbance (Morey 2010).

MACT did not reduce identity disturbance at end of treatment compared with MACT + TA (MD −4.88, 95% CI −14.98 to 5.22; 1 trial, 16 participants; P = 0.34; Analysis 22.7.6).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, chronic feelings of emptiness, impulsivity, abandonment, dissociation and psychotic-like symptoms, depression, attrition, and adverse effects.

22.8 MACT versus MACT + TA (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Morey 2010).

MACT did not reduce attrition at end of treatment compared with MACT + TA (RR 0.80, 95% CI 0.33 to 1.92; 1 trial, 16 participants; P = 0.62; Analysis 22.8).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

22.9 Meta-cognitive training for BPD (B-MCT) versus progressive muscle relaxation (PMR) (continuous)

Primary outcome: BPD symptom severity

One trial reported continuous data on BPD symptom severity (Schilling 2018).

B-MCT did not reduce BPD symptom severity at end of treatment compared PMR (MD −1.80, 95% CI −4.97 to 1.37; 1 trial, 49 participants; P = 0.27; Analysis 22.9.1).

PMR reduced BPD symptom severity at zero to six months follow-up compared B-MCT (MD −3.60, 95% CI −7.16 to −0.04; 1 trial, 39 participants; P = 0.05; Analysis 22.9.2).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcomes: depression

One trial reported continuous data on depression (Schilling 2018).

B-MCT did not reduce depression at end of treatment compared with PMR (MD −3.20, 95% CI −9.91 to 3.51; 1 trial, 54 participants; P = 0.35; Analysis 22.9.3).

B-MCT reduced depression at zero to six months follow-up compared with PMR (MD 8.50, 95% CI 2.03 to 14.97; 1 trial, 47 participants, P = 0.01 Analysis 22.9.4).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition and adverse effects.

22.10 B-MCT versus PMR (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Schilling 2018).

B-MCT did not reduce attrition at end of treatment compared with PMR (RR 0.95, 95% CI 0.45 to 2.00; 1 trial, 74 participants; P = 0.89; Analysis 22.10).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

22.11 Motive-oriented therapeutic relationship (MOTR) versus good psychiatric management (GPM)

Primary outcomes

BPD symptom severity

One trial reported continuous data on BPD symptom severity (Kramer 2014).

MOTR did not reduce BPD symptom severity at end of treatment compared with GPM (MD 0.07, 95% CI −0.38 to 0.52; 1 trial, 74 participants = 74; P = 0.76; Analysis 22.11.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

Psychosocial functioning

Two trials reported continuous data on psychosocial functioning (Kramer 2011; Kramer 2014).

MOTR group improved psychosocial functioning at end of treatment compared with GPM (SMD −0.45, 95% CI −0.85 to −0.05: 2 trials, 99 participants; I^2 = 0%; P = 0.03; Analysis 22.11.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm and suicide-related outcomes.

Secondary outcomes: interpersonal problems

Two trials reported continuous data on interpersonal problems (Kramer 2011; Kramer 2014).

MOTR group improved interpersonal problems at end of treatment compared with GPM (SMD −0.56, 95% CI −0.97 to −0.16: 2 trials, 99 participants; I^2 = 0%; P = 0.006; Analysis 22.11.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition, and adverse effects.

22.12 MOTR versus GPM (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

Two trials reported dichotomous data on attrition (Kramer 2011; Kramer 2014).

MOTR group did not reduce attrition at end of treatment compared with GPM (RR 0.61, 95% CI 0.26 to 1.41: 2 trials, 110 participants; I^2 = 34%; P = 0.25; Analysis 22.12).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

23. Schema-focused therapy (SFT) versus active treatment

23.1 SFT versus transference-focused psychotherapy (TFP) (continuous)

Primary outcome: BPD symptom severity

One trial reported continuous data on BPD symptom severity (Giesen-Bloo 2006).

SFT reduced BPD symptom severity at end of treatment compared with TFP (MD −4.95, 95% CI −9.59 to −0.31; 1 trial, 86 participants; P = 0.04; Analysis 23.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcomes

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition and adverse effects.

23.2 SFT versus TFP (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Giesen-Bloo 2006).

SFT reduced attrition at zero to six months follow-up compared with TFP (RR 0.52, 95% CI 0.30 to 0.92; 1 trial, 88 participants; P = 0.02; Analysis 23.2).

No data were available for end of treatment, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

23.3 SFT versus SFT + therapist availability (continuous)

Primary outcome: BPD symptom severity

One trial reported continuous data on BPD symptom severity (Nadort 2009).

SFT did not reduce BPD severity at end of treatment compared with TFP (MD −0.30, 95% CI −5.51 to 4.91; 1 trial, 61 participants; P = 0.91; Analysis 23.3).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcomes

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, attrition and adverse effects.

23.4 SFT versus SFT + therapist availability (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Nadort 2009).

SFT did not reduce attrition at zero to six months follow-up compared with TFP (RR 0.91, 95% CI 0.35 to 2.41; 1 trial, 62 participants; P = 0.86; Analysis 23.4).

No data were available for end of treatment, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

24. Systems training for emotional predictability and problem solving (STEPPS)-based psychoeducation (STEPPS-PE) versus cognitive rehabilitation (CR)

24.1 STEPPS-PE versus CR (continuous)

Primary outcome: BPD symptom severity

One trial reported continuous data on BPD symptom severity (Pascual 2015).

STEPPS-PE reduced BPD symptom severity at end of treatment compared with cognitive rehabilitation (MD −3.67, 95% CI −6.52 to −0.82; 1 trial, 46 participants; P = 0.01; Analysis 24.1.1).

Cognitive rehabilitation reduced BPD symptom severity at zero to six months follow-up compared with STEPPS-PE (MD 4.68, 95% CI 1.42 to 7.94; 1 trial, 42 participants; P = 0.005; Analysis 24.1.2).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcomes

Impulsivity

One trial reported continuous data on impulsivity (Pascual 2015).

Cognitive rehabilitation reduced impulsivity at end of treatment compared with STEPPS-PE (MD 1.99, 95% CI 0.06 to 3.92; 1 trial, 46 participants; P = 0.04; Analysis 24.1.3).

Cognitive rehabilitation reduced impulsivity at zero to six months follow-up compared with STEPPS-PE (MD 9.92, 95% CI 7.38 to 12.46; 1 trial, 42 participants; P < 0.001; Analysis 24.1.4).

No data were available for six to 12 months and above 12 months follow-up.

Depression

One trial reported continuous data on depression (Pascual 2015).

STEPPS-PE reduced depression at end of treatment compared with cognitive rehabilitation (MD −2.58, 95% CI −3.62 to −1.54; 1 trial, 48 participants; P < 0.001; Analysis 24.1.5).

STEPPS-PE reduced depression at zero to six months follow-up compared to cognitive rehabilitation (MD −10.11, 95% CI −11.35 to −8.87; 1 trial, 42 participants; P < 0.001; Analysis 24.1.6).

No data were available for six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, attrition and adverse effects.

24.2 STEPPS-PE versus CR (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Pascual 2015).

STEPPS-PE did not reduce attrition at end of treatment compared with cognitive rehabilitation (RR 0.76, 95% CI 0.39 to 1.47; 1 trial, 70 participants; P = 0.41; Analysis 24.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, and adverse effects.

25. Eclectic treatments versus active treatment

25.1 Combined inpatient and outpatient psychotherapy versus outpatient psychotherapy (continuous)

Primary outcome: psychosocial functioning

One trial reported continuous data on psychosocial functioning (Antonsen 2017).

Inpatient and outpatient psychotherapy did not improve psychosocial functioning at end of treatment compared with psychotherapy alone (MD 6.50, 95% CI −0.06 to 13.06; 1 trial, 52 participants; P = 0.05; Analysis 25.1.1).

Inpatient and outpatient psychotherapy did not improve psychosocial functioning at above 12 months follow-up compared with psychotherapy alone (MD −5.70, 95% CI −13.33 to 1.93; 1 trial, 52 participants; P = 0.14, Analysis 25.1.2).

No data were available for zero to six months and six to 12 months follow-up.

No data were available on any time point for BPD symptom severity, self-harm, and suicide-related outcomes.

Secondary outcomes

Interpersonal problems

One trial reported continuous data on interpersonal problems (Antonsen 2017).

Inpatient and outpatient psychotherapy did not reduce interpersonal problems at end of treatment (three years) compared with psychotherapy alone (MD 0.05, 95% CI −0.24 to 0.34; 1 trial, 52 participants; P = 0.74; Analysis 25.1.3).

Participants in the inpatient and outpatient psychotherapy reported fewer interpersonal problems at above 12 months follow-up compared with psychotherapy alone (MD −0.42, 95% CI −0.77 to −0.0; 1 trial, 52 participants; P = 0.02; Analysis 25.1.4).

No data were available for zero to six months and six to 12 months follow-up.

Identity disturbance

One trial reported continuous data on identity disturbance (Antonsen 2017).

Inpatient and outpatient psychotherapy did not reduce identity disturbance at end of treatment (three years) compared with psychotherapy alone (MD −0.25, 95% CI −0.59 to 0.09; 1 trial, 52 participants; P = 0.15; Analysis 25.1.5).

Inpatient and outpatient psychotherapy reported less identity disturbance at above 12 months follow-up compared with psychotherapy alone (MD −0.47, 95% CI −0.78 to −0.16; 1 trial, 52 participants; P = 0.003; Analysis 25.1.6).

No data were available for zero to six months and six to 12 months follow-up.

Depression

One trial reported continuous data on depression (Antonsen 2017).

Inpatient and outpatient psychotherapy did not reduce depression at end of treatment (three years) compared with psychotherapy alone (MD −0.40, 95% CI −6.25 to 5.45; 1 trial, 52 participants; P = 0.8; Analysis 25.1.7).

Inpatient and outpatient psychotherapy did not reduce depression at above 12 months follow-up compared to psychotherapy alone (MD −4.70, 95% CI −11.02 to 1.62; 1 trial, 52 participants; P = 0.14; Analysis 25.1.8).

No data were available for zero to six months and six to 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, abandonment, dissociation and psychotic-like symptoms, attrition and adverse effects.

25.2 Combined inpatient and outpatient psychotherapy versus outpatient psychotherapy (dichotomous)

Primary outcomes

No data were available on any time point for BPD symptom severity, self-harm, suicide-related outcomes, and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Antonsen 2017).

Inpatient and outpatient psychotherapy did not reduce attrition at end of treatment (three years) compared with psychotherapy alone (RR 0.62, 95% CI 0.26 to 1.49; 1 trial, 52 participants; P = 0.28; Analysis 25.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

25.3 Integrative BPD-oriented adolescent family therapy (I-BAFT) versus individual drug counselling (IDC)

Primary outcome: BPD symptom severity

One trial reported dichotomous data on BPD symptom severity (Santisteban 2015).

Integrative BPD did not reduce BPD severity at end of treatment compared with control (RR 0.91, 95% CI 0.50 to 1.64; 1 trial, 40 participants; P = 0.75; Analysis 25.3.1).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for self-harm, suicide-related outcomes and psychosocial functioning.

Secondary outcome: attrition

One trial reported dichotomous data on attrition (Santisteban 2015).

Integrative BPD did not reduce attrition at end of treatment compared with control (RR 0.50, 95% CI 0.18 to 1.40; 1 trial, 40 participants; P = 0.19; Analysis 25.3.2).

No data were available for zero to six months, six to 12 months and above 12 months follow-up.

No data were available on any time point for anger, affective instability, chronic feelings of emptiness, impulsivity, interpersonal problems, abandonment, identity disturbance, dissociation and psychotic-like symptoms, depression, and adverse effects.

Subgroup analyses

Where data permitted, we conducted our planned subgroup analyses, in addition to two post hoc subgroup analyses, for the primary outcomes of BPD symptom severity and psychosocial functioning. For the 'types of comparisons' subgroup, we also conducted analyses for self-harm and suicide-related outcomes. Only subgroups with two or more trials were included in the subgroup analyses.

26. Therapeutic approaches

26.1 BPD symptom severity

We compared the effects of DBT versus MBT versus psychodynamic psychotherapy versus STEPPS versus eclectic treatments for the outcome of BPD symptom severity. We found no evidence of significant differences between the subgroups (test for subgroup differences: Chi^2 = 6.88, df = 4 (P = 0.14), I^2 = 41.8%): DBT SMD = −0.60 (95% CI −1.05 to −0.14; 3 trials, 149 participants; I^2 = 42%; P = 0.01; Analysis 26.1.1); MBT SMD = −0.13 (95% CI −0.38 to 0.11; 5 trials, 267 participants; I^2 = 0%; P = 0.28; Analysis 26.1.2); psychodynamic psychotherapy SMD = −0.29 (95% CI −0.66 to 0.09; 4 trials, 222 participants; I^2 = 38%; P = 0.13; Analysis 26.1.3); STEPPS SMD = −0.39 (95% CI −0.63 to −0.15; 3 trials, 273 participants; I^2 = 0%; P = 0.001; Analysis 26.1.4); and eclectic treatments SMD = −0.90 (95% CI −1.57 to −0.23; 2 trials, 134 participants; I^2 = 67%; P = 0.008; Analysis 26.1.5). For illustrative purposes, we present the results of other therapeutic approaches from single trials in Analysis 26.1.6 to Analysis 26.1.10.

26.2 Psychosocial functioning

We compared the effects of DBT versus MBT versus psychodynamic psychotherapy versus eclectic treatments for the outcome of psychosocial functioning. We found no evidence of significant differences between the subgroups (test for subgroup differences: Chi^2 = 0.67, df = 3 (P = 0.88), I^2 = 0%): DBT SMD = −0.36 (95% CI −0.69 to −0.03; 6 trials, 225 participants; I^2 = 31%; P = 0.03; Analysis 26.2.1); MBT SMD = −0.54 (95% CI −1.24 to 0.16; 3 trials, 239 participants; I^2 = 83%; P = 0.13; Analysis 26.2.2); psychodynamic psychotherapy SMD = −0.69 (95% CI −1.98 to 0.59; 4 trials, 140 participants; I^2 = 92%; P = 0.29; Analysis 26.2.3); and eclectic treatments SMD = −0.57 (95% CI −1.10 to −0.04; 2 trials, 231 participants; I^2 = 63%; P = 0.03; Analysis 26.2.11). For illustrative purposes, we present the results of other therapeutic approaches from single trials in Analysis 26.2.5 to Analysis 26.2.11.

27. Age: BPD symptom severity

We compared the effects for the subgroup of 15 to 18 years of age versus above 18 years of age for the outcome of BPD symptom severity. There were significant differences between subgroups (test for subgroup differences: Chi^2 = 5.03, df = 1 (P = 0.02), I^2 = 80.1%): 15 to 18 years of age SMD = −0.14 (95% CI −0.46 to 0.17; 2 trials, 156 participants; I^2 = 0%; P = 0.38; Analysis 27.1.1); and above 18 years of age SMD = −0.57 (95% CI −0.76 to -0.37; 20 trials, 1088 participants; I^2 = 57%; P < 0.001; Analysis 27.1.2).

28. Duration

28.1 BPD symptom severity

We compared the effects of less than six months versus six to 12 months versus above 12 months duration for the outcome of BPD symptom severity. We found no evidence of significant differences between the subgroups (test for subgroup differences: Chi^2 = 3.86, df = 2 (P = 0.15), I^2 = 48.2%): less than six months SMD = −0.76 (95% CI −1.10 to −0.42; 8 trials, 525 participants; I^2 = 69%; P < 0.001; Analysis 28.1.1); six to 12 months SMD = −0.36 (95% CI −0.60 to −0.12; 11 trials, 606 participants; I^2 = 50%; P = 0.003; Analysis 28.1.2); and above 12 months SMD = −0.37 (95% CI −0.75 to 0.01; 3 trials, 113 participants; I^2 = 0%; P = 0.06; Analysis 28.1.3).

28.2 Psychosocial functioning

We compared the effects of less than six months versus six to 12 months versus above 12 months durations for the outcome of psychosocial functioning. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 2.24, df = 2 (P = 0.33), I^2 = 10.9%): less than six months SMD = −0.31 (95% CI −0.73 to 0.11; 6 trials, 468 participants; I^2 = 73%; P = 0.14; Analysis 28.2.1); six to 12 months SMD = −0.25 (95% CI −0.49 to −0.01; 10 trials, 535 participants; I^2 = 45%; P = 0.04; Analysis 28.2.2); and above 12 months SMD = −0.86 (95% CI −1.62 to −0.10; 4 trials, 263 participants; I^2 = 86%; P = 0.03; Analysis 28.2.3).

29. Mode of therapy

29.1 BPD symptom severity

We compared the effects of individual therapy versus group therapy versus mixed therapy for the outcome of BPD symptom severity. There were significant differences between subgroups (test for subgroup differences: Chi^2 = 13.23, df = 2 (P = 0.001), I^2 = 84.9%): individual therapy SMD = −0.39 (95% CI −0.63 to −0.16; 8 trials, 520 participants; I^2 = 39%; P = 0.001; Analysis 29.1.1); group therapy SMD = −0.89 (95% CI −1.21 to −0.57; 8 trials, 438 participants; I^2 = 57%; P < 0.001; Analysis 29.1.2); and mixed therapy SMD = −0.15 (95% CI −0.38 to 0.09; 6 trials, 286 participants; I^2 = 0%; P = 0.22; Analysis 29.1.3).

29.2 Psychosocial functioning

We compared the effects of individual therapy versus group therapy versus mixed therapy for the outcome of psychosocial functioning. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 0.89, df = 2 (P = 0.64), I^2 = 0%): individual therapy = SMD −0.31 (95% CI −0.75 to 0.12; 8 trials, 570 participants; I^2 = 80%; P = 0.16; Analysis 29.2.1); group therapy SMD = −0.44 (95% CI −0.65 to −0.23; 7 trials, 366 participants; I^2 = 0%; P < 0.001; Analysis 29.2.2); and mixed therapy SMD = −0.63 (95% CI −1.14 to −0.13; 7 trials, 378 participants; I^2 = 80%; P = 0.01; Analysis 29.2.3).

30. Setting

30.1 BPD symptom severity

We compared the effects of inpatient versus outpatient settings for the outcome of BPD symptom severity. There were significant differences between subgroups (test for subgroup differences: Chi^2 = 9.18, df = 1 (P = 0.002), I^2 = 89.1%): inpatient SMD = −0.07 (95% CI −0.34 to 0.20; 2 trials, 217 participants; I^2 = 0%; P = 0.61; Analysis 30.1.1); and outpatient SMD = −0.58 (95% CI −0.77 to −0.39; 20 trials, 1027 participants; I^2 = 51%; P < 0.001; Analysis 30.1.2).

30.2 Psychosocial functioning

We compared the effects of inpatient versus outpatient versus combined inpatient and outpatient settings for the outcome of psychosocial functioning. There were significant differences between subgroups (test for subgroup differences: Chi^2 = 15.99, df = 2 (P = 0.0003), I^2 = 87.5%): inpatient SMD = −0.85 (95% CI −1.24 to −0.46; 2 trials, 179 participants; I^2 = 0%; P < 0.001; Analysis 30.2.1); outpatient SMD = −0.31 (95% CI −0.54 to −0.08; 18 trials, 1057 participants; I^2 = 67%; P = 0.008; Analysis 30.2.2); and combined inpatient and outpatient SMD = −1.34 (95% CI −1.84 to −0.84; two trials, 78 participants; I^2 = 0%; P < 0.001; Analysis 30.2.3).

31. Type of raters

31.1 BPD symptom severity

We compared the effects of self-rated versus clinician-rated for the outcome of BPD symptom severity. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 1.79, df = 1 (P = 0.18), I^2 = 44.2%): self-rated SMD = −0.74 (95% CI −1.19 to −0.29; 8 trials, 408 participants; I^2 = 77%; P = 0.001; Analysis 31.1.1); and clinician-rated SMD = −0.42 (95% CI −0.58 to −0.25; 14 trials, 836 participants; I^2 = 24%; P < 0.001; Analysis 31.1.2).

31.2 Psychosocial functioning

We compared the effects of self-rated versus clinician-rated for the outcome of psychosocial functioning. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 2.86, df = 1 (P = 0.09), I^2 = 65.1%): self-rated SMD = −0.29 (95% CI −0.60 to 0.03; 12 trials, 728 participants; I^2 = 76%; P = 0.07; Analysis 31.2.1); and clinician-rated SMD = −0.66 (95% CI −0.96 to −0.37; 10 trials, 586 participants; I^2 = 54%; P < 0.001; Analysis 31.2.2).

32. Types of TAU

32.1 BPD symptom severity

We compared the effects of obligatory TAU versus optional TAU for the outcome of BPD symptom severity. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 0.25, df = 1 (P = 0.61), I^2 = 0%): obligatory TAU SMD = −0.50 (95% CI −0.70 to −0.30; 19 trials, 1071 participants; I^2 = 60%; P < 0.001; Analysis 32.1.1); and unspecified TAU SMD = −0.63 (95% CI −1.09 to -0.17; 3 trials, 173 participants; I^2 = 36%; P = 0.007; Analysis 32.1.2).

32.2 Psychosocial functioning

We compared the effects of obligatory TAU versus optional TAU for the outcome of psychosocial functioning. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 3.18, df = 1 (P = 0.07), I^2 = 68.6%): obligatory TAU SMD = −0.32 (95% CI −0.56 to −0.09; 17 trials, 1002 participants; I^2 = 65%; P = 0.007; Analysis 32.2.1); and unspecified TAU SMD = −0.96 (95% CI −1.62 to −0.30; 5 trials, 312 participants; I^2 = 84%; P = 0.004; Analysis 32.2.2).

33. Types of comparison group

33.1 BPD symptom severity

We compared the effects of trials with TAU versus trials with waiting list for the outcome of BPD symptom severity. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 0.01, df = 1 (P = 0.92), I^2 = 0%): trials with TAU SMD = −0.52 (95% CI −0.70 to −0.33; 22 trials, 1244 participants; I^2 = 57%; P < 0.001; Analysis 33.1.1); and trials with waiting list (SMD −0.49, 95% CI −0.93 to −0.05; 3 trials, 161 participants; I^2 = 44%; P = 0.03; Analysis 33.1.2).

33.2 Psychosocial functioning

We compared the effects of trials with TAU versus trials with waiting list for the outcome of psychosocial functioning. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 0.18, df = 1 (P = 0.67), I^2 = 0%): trials with TAU SMD = −0.45 (95% CI −0.68 to −0.22; 22 trials, 1314 participants; I^2 = 72%; P = 0.0001; Analysis 33.2.1); and trials with waiting list SMD = −0.56 (95% CI −1.01 to −0.11; 5 trials, 219 participants; I^2 = 59%; P = 0.01; Analysis 33.2.2).

34. Types of scales

34.1 BPD symptom severity

We compared the effects of ZAN-BPD versus SCID versus BEST versus BPDSI on the outcome of BPD symptom severity. There were significant differences between subgroups (test for subgroup differences: Chi^2 = 15.40, df = 3 (P = 0.002), I^2 = 80.5%): ZAN-BPD SMD = −0.45 (95% CI −0.69 to −0.20; 4 trials, 261 participants; I^2 = 0%; P = 0.0004; Analysis 34.1.1); SCID SMD = −0.58 (95% CI −1.16 to −0.00; 3 trials, 112 participants; I^2 = 47%; P = 0.05; Analysis 34.1.2); BEST SMD = −1.10 (95% CI −1.47 to −0.72; 4 trials, 147 participants; I^2 = 10%; P < 0.001; Analysis 34.1.3); and BPDSI SMD = −0.21 (95% CI −0.45 to 0.04; 4 trials, 267 participants; I^2 = 0%; P = 0.10; Analysis 34.1.4. For illustrative purposes, the results of other scales from single trials are report in Analysis 34.1.5 to Analysis 34.1.11.

34.2 Psychosocial functioning

We compared the effects of the GAF versus GAS versus SAS on the outcome of psychosocial functioning. There were no significant differences between subgroups (test for subgroup differences: Chi^2 = 1.39, df = 2 (P = 0.50), I^2 = 0%): GAF SMD = −0.73 (95% CI −1.41 to −0.05; 4 trials, 204 participants; I^2 = 78%; P = 0.04; Analysis 34.2.1); GAS SMD = −0.71 (95% CI −0.96 to −0.46; 4 trials, 330 participants; I^2 =

0%; P < 0.001; Analysis 34.2.2); and SAS SMD = −0.23 (95% CI −0.99 to 0.53; 4 trials, 283 participants; I^2 = 88%; P = 0.55; Analysis 34.2.3). For illustrative purposes, the results of other scales from single trials are reported in Analysis 34.2.4. to Analysis 34.2.13

Sensitivity analysis

We conducted a TSA as an sensitivity analysis on the significant findings for all primary outcomes and the secondary outcome of depression at end of treatment. The RIS was reached for BPD symptom severity, self-harm, suicide-related outcomes and psychosocial functioning. However, due to inconsistency for self-harm and suicide-related outcomes, we could only exclude the risk of a false positive finding (type 1 error) for BPD symptom severity and psychosocial functioning. The RIS was not reached for depression.

We used both the fixed-effect and random-effects models in all meta-analyses. However, when there were two or more trials included in an analysis, we chose to report the results of the random-effects model, which gives greater weight to smaller trials; where only one trial was included in an analysis, we reported the results of the fixed-effect model. Statistical significance changed in 13 analyses and in those cases we reported the results of both the random-effects and fixed-effect models (see Analysis 3.7, Analysis 3.12, Analysis 4.1.3, Analysis 4.5.1, Analysis 4.7.1, Analysis 4.7.2, Analysis 4.7.4, Analysis 5.5.1, Analysis 6.4.1, Analysis 6.7.1, Analysis 14.3, Analysis 15.5, Analysis 18.12).

DISCUSSION

Summary of main results

We considered 400 full-text reports and, of these, we included 75 trials that randomised a total of 4507 participants. The age ranged from 14.8 to 45.7 mean years, and the majority of included persons were female. The length of the trials ranged from one to 36 months, with most of them performed in outpatient settings. We judged all included trials to be at high risk of bias.

DBT and related treatments were the most intensively studied, with more than one-third of all included trials comparing DBT to TAU, a waiting list or an alternate active treatment (26 RCTs). Fifteen RCTs investigated the effects of CBT and related treatments, seven of which assessed MBT or eclectic treatments, five evaluated BPD-specific psychodynamic therapies, four investigated SFT and related treatments, and three assessed STEPPS and IPT, two investigated TFP, PE or MOTR, and one evaluated CAT, ACT, JCP or motivation feedback, respectively.

In the following section, we summarise the main findings for the pooled analyses of psychotherapy versus TAU or waiting list for our primary outcomes (BPD symptom severity, self-harm, suicide-related outcomes and psychosocial functioning), and for those secondary outcomes that are not a part of the symptom characteristics of BPD (depression, attrition and adverse effects). We report end-of-treatment data. We advise the interested reader to explore the Effects of interventions section for a more elaborated description of the effect of psychotherapy on the remaining secondary outcomes, and follow-up data. There, they will also find a complete overview of the effects of specific kinds of psychotherapy (such as DBT, MBT, CBT, etc.).

Psychotherapy versus TAU

Comparing the effects of psychotherapy with TAU, we observed significant effects for all primary outcomes at the end of treatment (Summary of findings 1).

Psychotherapy significantly reduced BPD symptom severity (SMD −0.52, 95% CI −0.70 to −0.33; 22 trials, 1244 participants) compared with TAU. This corresponds to a MD of −3.6 (95% CI −4.4 to −2.08) on the ZAN-BPD scale, which ranges from 0 to 36. This represents a clinically relevant improvement in BPD symptoms. The MIREDIF on this scale is −3.0 points (Crawford 2018a).

Psychotherapy also showed a significant reduction in self-harm when measured as a continuous outcome (SMD −0.32, 95% CI −0.49 to −0.14; 13 trials, 616 participants), but not a dichotomous outcome. The significant effect of continuous outcomes corresponds to a MD of −0.816 (95% CI −1.25 to 0.35) on the DSHI, which ranges from 0 to 34. The MIREDIF on this scale is −1.25 points, which corresponds to ½ SD (Farivar 2004). Clinically, this finding does not represent an important reduction in self-harm for people with BPD.

Additionally, suicide-related outcomes were significantly reduced in both continuous (SMD −0.34, 95% CI −0.57 to −0.11; 13 trials, 616 participants) and dichotomous outcomes (RR 0.27, 95% CI 0.11 to 0.67; 5 trials, 396 participants). The improvement corresponded to a MD of −0.11 (95% CI −0.19 to −0.034) on the Suicidal Attempt Self Injury Interview. The MIREDIF on this scale is −0.17 points, which corresponds to ½ SD (Farivar 2004). These findings suggest that suicide-related outcomes improved following treatment, but these improvements did not quite reach a clinically relevant level. However, when it comes to suicide or suicide attempts, any reduction is of importance.

Psychosocial functioning improved significantly following psychotherapy compared with TAU (SMD −0.45, 95% CI −0.68 to −0.22; 22 trials, 1314 participants). This corresponds to a MD of −2.8 (95% CI −4.25 to −1.38) on the GAF Scale, which ranges from 0 to 100. The MIREDIF on this scale is −4.0 points (Amri 2014); therefore, the improvement did not reach clinical relevance.

Regarding our secondary outcomes, we observed a significant reduction in depression for participants receiving psychotherapy compared to TAU (SMD −0.39, 95% CI −0.61 to −0.17; 22 trials, 1570 participants). This corresponds to −2.45 on the Hamilton Depression Scale, and does not quite reach the MIREDIF on this scale, which is 3.0 points (NICE CG90) .

Sufficient data were not available for effect size calculation for the outcome of adverse effects.

Our additional TSA on all significant findings of the primary outcomes found that the RIS was reached for all primary outcomes but not for the secondary outcome of depression. However, only for BPD symptoms severity and psychosocial functioning could we reject the possibility of type 1 error.

Only 15 trials reported on the effect following end of treatment at zero to six months, six to 12 months and > 12 months (Amianto 2011; Andreoli 2016; Bateman 1999; Blum 2008; Davidson 2006; Gleeson 2012; Gregory 2008b; Jørgensen 2013; Kredlow 2017a; Linehan 2006; McMurran 2016; Robinson 2016; Soler 2009; Van den Bosch 2005; Weinberg 2006). There was no effect on BPD severity

at follow-up when assessed as a continuous measure; however, an improvement was observed at > 12 months follow-up in the number of people presenting with severe BPD. In addition, the number of persons with self-harm was reduced at the zero to six months, six to 12 months and > 12 months follow-up time points. Suicide-related behaviour was reduced at six to 12 months follow-up, and a reduction in the number of persons with suicidal behaviour was seen at > 12 months follow-up. There was an improvement in psychosocial functioning at zero to six months follow-up; however, this was not sustained at six to 12 months or at > 12 months follow-up time points.

Regarding the secondary outcomes, there was an improvement in depression at zero to six months and > 12 months follow-up, as well as a reduction in adverse effects at > 12 months follow-up only. No improvement in anger, affective instability, impulsivity, emptiness, interpersonal problems or abandonment was observed at follow-up.

Psychotherapy versus waiting list or no treatment

Comparing the effects of psychotherapy with waiting list, we observed effects in favour of psychotherapy for the primary outcomes of BPD severity (SMD −0.49, 95% CI −0.93 to −0.05; 3 trials, 161 participants) and psychosocial functioning (SMD −0.56, 95% CI −1.01 to −0.11; 5 trials, 219 participants. No clear differences were found for self-harm and suicide-related outcomes. See Summary of findings 2.

We moreover observed a significant reduction in depression for participants receiving psychotherapy compared to waiting list or no treatment (SMD −1.28, 95% CI −2.21 to −0.34; 6 trials, 239 participants). No reductions were detected in attrition, and once again, sufficient data were not available for effect size calculation for the outcome of adverse effects.

Only one trial, Bellino 2010, reported on the effect following end of treatment (zero to six months, six to 12 months and > 12 months follow-up periods). Follow-up data were reported on psychosocial functioning, in which an improvement was observed at zero to six months and six to 12 months post-treatment. There was no significant improvement observed at > 12 months post-treatment. Regarding the secondary outcomes, improvements in both impulsivity and interpersonal problems were observed at zero to six months, six to 12 months and > 12 months post-treatment. No improvement was observed in affective instability at any of the follow-up time points.

Individual treatment approaches

Among distinct BPD-specific therapies, most findings were based on single trials. DBT and MBT had the highest numbers of primary trials, with DBT accounting for roughly one-third of all included trials, followed by MBT with seven RCTs.

Compared to TAU, we observed significant effects of DBT for the primary outcomes of BPD severity (SMD −0.60, 95% CI −1.05 to −0.14; 3 trials, 149 participants), self-harm (SMD −0.28, 95% CI −0.48 to −0.07; 7 trials, 376 participants) and psychosocial functioning (SMD −0.36, 95% CI −0.69 to −0.03; 6 trials, 225 participants). MBT was found to have significant effects on self-harm (RR 0.62, 95% CI 0.49 to 0.80; 3 trials, 252 participants) and suicidality (RR 0.10, 95% CI 0.04, 0.30, 3 trials, 218 participants). See Summary of findings 3.

Subgroup analysis and investigation of heterogeneity

We had intended to conduct several subgroup analyses, but not all were possible due to a lack of data. See Table 1 for more information.

In one subgroup analysis, we tested for differences between psychotherapeutic approaches appearing in two or more trials. We found no significant subgroup differences between the different therapeutic approaches for BPD symptom severity and psychosocial functioning.

To test the statistical heterogeneity in our analyses of BPD symptom severity and psychosocial functioning, we added a post hoc subgroup analysis exploring the different measurement scales versus each other. We found significant differences between ZAN-BPD, SCID, BEST and BPDSI, with BEST providing the highest effect estimate. By differentiating between scales, we found that the heterogeneity between trials was I^2 = 0% with ZAN-BPD; I^2 = 47% with SCID; I^2 = 10% with BEST; and I^2 = 0% with BPDSI. The results suggest that much of the statistical heterogeneity found in the analysis of psychotherapy versus TAU for BPD symptom severity was due to the various scales used in trials. We found no significant differences between GAF, GAS and SAS, and no reductions in heterogeneity.

We found significant subgroup differences for BPD symptom severity for age, where the effects of psychotherapy were higher for the subgroup 'older than 18 years of age'; 'mode of therapy', with group therapy being more effective than individual or mixed therapy; and setting, with outpatient groups being more effective than inpatient groups. Additionally, we found significant differences for psychosocial functioning for setting, with the combination of inpatient and outpatient groups and inpatient groups alone showing to be more effective than outpatient groups. We found no subgroup differences for BPD symptom severity for duration and type of raters, or for psychosocial functioning for duration, mode of therapy and types of raters.

trials of psychotherapy versus TAU did not indicate any significant subgroup differences for BPD symptom severity and psychosocial functioning compared with trials of psychotherapy versus waiting list or no treatment. Likewise, we found no subgroup differences for the different types of TAU. Therefore, effect estimates do not seem to differ between comparisons with control groups consisting of any kind of unspecified intervention, such as TAU, standard care or regular appointments, and comparisons with waiting list or no treatment, the participants of which were not paid any special attention at all.

Previous review

In contrast to the previous versions of this review (Binks 2006; Stoffers-Winterling 2012), we broadened the scope to include the treatment of adolescents also. We were able to include only three RCTs that focused solely on adolescents: the Mehlum 2014 trial on DBT-A; the Rossouw 2012b trial on MBT-A; and the Schuppert 2012 trial on ERT, an adaptation of STEPPS for adolescents. Another pilot RCT on HYPE + CAT + SFET included participants from ages 15 to 25 years old, with a mean age of 18.4 years (SD = 2.9) (Gleeson 2012). Subgroup analyses revealed that adolescents benefited less from psychotherapy than those older than 18 years of age. However, the power was much too low to detect any true effects, with sample sizes ranging from 10 participants (subsample of

participants with five or more DSM-IV BPD criteria in the Mehlum 2014 trial) to 97 participants (in Schuppert 2012). Notably, we only included trial samples or subsamples in which at least 70% of participants had full BPD (i.e. fulfilled a minimum of five DSM BPD criteria). Oftentimes, however, adolescents may only fulfil criteria at a subthreshold level while both their personality and BPD are still developing. Nevertheless, they might profit from BPD-specific treatments in terms of preventing the development of full threshold BPD later in life.

Overall completeness and applicability of evidence

In most cases, we were able to calculate the effect sizes from the data reported in the included trials. If information was missing, we contacted and requested the missing information from the trial authors. Therefore, there is no evident bias within this review as a consequence of inadequate inclusion of existing data.

We rated all trials at high risk of bias, with the most prevalent risk of bias being categorised as 'other risk of bias'; that is insufficient treatment adherence, allegiance bias or attention bias, which might lead to biased data.

Participants

The majority of trials included mainly females, with only two trials solely including males (Bianchini 2019; Kamalabadi 2012). This configuration may reflect the reality of clinical settings, where approximately 75% of all BPD diagnoses are assigned to women (APA 2000). There are, however, contradictory findings pointing towards balanced proportions or an even higher prevalence in men (Sansone 2011). Men with BPD may display a different clinical picture than women, especially with antisocial features being more prevalent in men than in women with BPD (Sansone 2011). Clinically, this may mediate different treatment approaches or special requirements, which may not be reflected in most of the RCT evidence, which stems from either all female or predominantly female samples (see the Characteristics of included studies tables). In addition, in several of the included trials, full antisocial personality disorders or antisocial features were reasons for exclusion. As such, the extent to which the findings in this review are applicable to men with BPD may be limited. Level of functioning at baseline was not available in several of the included trials. However, trials that reported level of functioning using objective measures, such as GAS, GAF, CGI or SFQ, showed that the degree of illness ranged from moderate to severe. Regarding comorbidity, most trials excluded participants with severe mental disorders, organic brain disorders and mental impairments. In sum, the findings of this review may apply mainly to females with a moderate to severe level of illness, and without severe comorbid mental disorders. We do not know how the lack of this information has affected our findings, only that we cannot generalise the findings to men, to females with low levels of illness or to those with severe comorbid mental disorders. On the other hand, several trials concentrated on people with BPD plus distinct comorbidities (i.e. PTSD, depression, eating disorders or substance use disorders). Moreover, subgroups analyses revealed a significant difference, where the effect of psychotherapy on BPD symptom severity and psychosocial functioning seemed lower for adolescents. However, only three trials on adolescents were included in the review, and readers should exercise caution when drawing conclusions.

Some argue that BPD treatment should start before the condition has developed fully, and stress the importance of early assessment and treatment (Chanen 2013; Sharp 2015). Therefore, psychological interventions may also be relevant for patients who have yet to fully fulfil the DSM-5 criteria. Nevertheless, with respect to the patient sample in this review, we only included adolescent samples if at least 70% of them fulfilled (a minimum five) DSM-5 criteria for a diagnosis of BPD. We decided to do so in order to assure a minimum level of clinical homogeneity throughout the overall pool of trials.

Interventions

The major psychotherapeutic treatments used in the treatment of BPD (DBT, MBT, SFT, TFP) have been tested in the RCTs included in this review. However, the number of available trials per intervention vary broadly, with the majority of trials investigating DBT; a very limited number of trials assessed SFT and TFP especially, which may not reflect their prevalence in clinical practice. The vast majority of primary trials were conducted in outpatient settings. However, psychotherapy may also be provided on inpatient wards (depending on the respective health system), but only limited evidence was available for this setting. Subgroups analyses showed no evidence of significant differences between psychotherapeutic approaches, indicating that all individual types of psychotherapy are effective in treating people with BPD. Most trials allowed concurrent psychotherapy and psychotropic treatments. As such, it cannot be ruled out that the concurrent treatment may have confounded the corresponding findings. However, we only included trials if possible concurrent treatments were the same for all trial groups.

Some interesting findings revealed that group therapy might be more effective than individual or mixed therapy for reducing BPD symptom severity. However, there was no evidence of subgroup differences for psychosocial functioning. Additionally, outpatient care seemed to be more effective than inpatient care in reducing BPD symptom severity, but not in improving psychosocial functioning, where a combination of inpatient and outpatient treatment was more effective. The duration of treatment does not seem to be a factor in the improvement of BPD symptoms and psychosocial functioning.

Comparisons

The treatments used in the control groups were largely heterogeneous, including TAU, which is a common label for controls. TAU itself may differ between different treatment formats, let alone between different health systems. In some trials, participants receiving TAU were free to use any kind of care, whereas other participants in receipt of TAU were required to receive a minimum standard of care whilst taking part in the trial (see Types of interventions). Consequently, the components of TAU will most certainly vary between countries, as the standard of care is known to differ depending on the national healthcare system.

The use of a control group in randomised trials provides a point of reference from which the effect of a given intervention is measured against. As such, a 'clean' control group is essential when we want to obtain insight into the magnitude of treatment effects and potential adverse effects. In psychiatric research, there is a lack of consensus on what constitutes an appropriate control intervention (Finch 2019). In accordance, we found that control groups across trials were heterogeneous and included, for example,

TAU, standard care or waiting list. In 72% of the included trials, either psychotherapeutic treatment was a part of the control intervention or concomitant psychotherapy was allowed while participating in the trial (for more information see Characteristics of included studies tables). As such, a majority of trials compared psychotherapeutic therapy against another intervention that included psychotherapeutic elements. The willingness to let people affected by BPD continue with different variations of psychotherapeutic therapy while included in a control group may indicate a general concern of otherwise withholding them from an important treatment. Yet a drawback of this approach is that it could potentially mask the difference in treatment effects between the control and intervention groups. Concurrently, we found that effects sizes were small, heterogeneous and largely insignificant for the majority of comparisons. There is a substantial need for larger, well-performed randomised trials that include standardised control groups before we can make firmer conclusions about the effects of psychological therapies in BPD.

Outcomes

The individual trials included a great variety of outcomes, with only minor consensus on what constituted core outcomes for BPD and how these ideally should be assessed. We identified high heterogeneity and significant differences between scales for BPD symptom severity, which might indicate that different scales may give different effect estimates. We found no significant differences between scales for psychosocial functioning, and there were no significant differences for self-rated and clinician-rated outcomes. In addition, core symptoms, such as fewer interpersonal conflicts or crises that both caregivers and people with BPD may consider essential when searching for helpful treatments, are sometimes neglected. The outcome of attrition must be interpreted with caution, as the likelihood of leaving a trial may depend on the specific type of control group used. For example, participants assigned to waiting lists may be more likely to leave a trial early than participants assigned to TAU or participants who are provided with regular appointments. Geographical conditions and accessibility of study centres can also play an important role, as rural regions with long distances to study centres may lead to higher dropout rates than urban settings (Blum 2008 trial completer analysis: high dropouts).

Most trials did not consider adverse effects but did consider suicidal or self-harming behaviour. These outcomes were categorised as primary outcomes in this review (see Appendix 4) and are usually classified as severe adverse effects. Future randomised trials should not only concentrate on these outcomes, but also transparently report non-serious adverse effects that occur during BPD treatment. Adverse effects of importance would include increased impulsive behaviour or substance use. Such outcomes may occur if psychotherapy induces excessive emotional arousal with which the affected person is not (yet) able to cope (Berk 2009).

For more information, see the Characteristics of included studies tables, where we describe the characteristics of each included trial in greater detail.

Quality of the evidence

We rated the quality of evidence using the GRADE approach, based on the following considerations; risk of bias, inconsistency, indirectness, imprecision and publication bias.

We assessed the risk of bias in all trials in accordance with the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2019). The majority of the trials were prone to selection bias, as well as attrition and reporting bias. High risk of bias in randomised clinical trials has been shown to overestimate benefits and underestimate harms (Kjaergard 2001; Lundh 2012; Moher 1998; Savović 2012a; Savović 2012b; Schulz 1995; Wood 2008). The results are based on 75 trials that involved a limited number of people (n = 4507). Most trials included small sample sizes, with the number of participants ranging from 7 to 151 in the individual trials. Heterogeneity in the reporting of outcomes and the interventions investigated in the individual trials hindered the pooling of effect estimates. Except for DBT, ERGT, MBT and MOTR, the review findings are based largely on single trial effects that could not be pooled. The small samples and inability to pool results led to imprecise effect estimates.

The highest risk of bias we observed in the individual trials was for the category of 'other bias', covering attention, affiliation or adherence bias. We rated approximately two-thirds of trials (49 out of 75) as having a high risk of bias, and another 21 RCTs as having an unclear risk of bias, leaving only five (i.e. 6.7%) RCTs at low risk of bias. We rated two-thirds of trials as having either a high or an unclear risk of bias in terms of both incomplete outcome data and selective reporting (only 19 trials out of 75 had a low risk of bias in these categories). We rated half or more of the trials as having applied appropriate means of random sequence generation, allocation concealment, and blinding of outcome assessment.

From the analyses regarding psychotherapy and DBT versus waiting list or no treatment for suicide-related outcomes and depression, we found one trial to be an outlier (Mohamadizadeh 2017). The trial was rated at high risk of bias due to unclear risks of bias in all domains. To ensure transparency, we did not exclude it from the analyses. However, sensitivity analyses showed that the trial's inclusion did not change any conclusions on the aforementioned outcomes.

Notably, there were only two RCTs out of 75 that included medication-free patients only. The majority of trials allowed participants to continue their respective drug treatments. There were no reports of different medication rates between the groups at baseline from any trial. Apart from those trials that included medication as a compulsory part of their respective treatment regimens for both groups (Bellino 2006; Bellino 2007; Bellino 2010; Jahangard 2012), 24 trials reported on actual medication use during the trial observation period: 17 found no difference in medication use between the groups (Antonsen 2017; Blum 2008; Bohus 2013; Bos 2010; Doering 2010; Elices 2016; Gleeson 2012; Leichsenring 2016; Lin 2019; Linehan 2015a; McMain 2009; McMain 2017; Mohamadizadeh 2017; Reneses 2013; Schuppert 2012; Sinnaeve 2018; Van den Bosch 2005); six reported a higher use of medications in their control groups (Bateman 1999; Bateman 2009; Gregory 2008; Linehan 1994; Linehan 2006; Turner 2000); and only one found a higher rate in the active treatment group (Andreoli 2016). Therefore, medication use as a possible confounding variable can be ruled out whenever beneficial effects for the experimental group were observed.

Potential biases in the review process

This review was designed to minimise the risk of potential biases. We developed a protocol, Storebø 2018, for this review in

accordance with the *Cochrane Handbook for Systematic Reviews of Interventions* (Higgins 2019). We conducted extensive searches of relevant databases, with no restrictions in language, publication year, publication type or publication status. Two independent review authors selected appropriate trials, extracted data, assessed the risk of bias and graded the quality of the evidence. Disagreements were resolved through discussion. We conducted a TSA, to estimate the RIS needed to either detect or reject a certain intervention effect.

With regard to our inclusion criteria (Criteria for considering studies for this review), we tried to retain a homogeneous pool of primary trials. However, there were some inconsistencies between trials, particularly pertaining to psychiatric comorbidity of trial participants. For example, although the presence of a substance-related disorder was a common exclusion criterion (see Types of participants), two trials required participants to have such a disorder (Gregory 2008b; Santisteban 2015), and another trial included a mixed sample of participants with and without substance abuse problems (Van den Bosch 2005). In addition, the severity of illness varied between trials, ranging from severe to mild.

We also went to great effort to try and obtain unpublished data pertaining to BPD subsamples where the full sample included fewer than 70% of participants with full BPD. We were able to obtain such subsample data from some trials, but in other cases, trial authors did not respond. We do not know why they did not respond, but it is possible that the subsample data we received are biased in a positive way (i.e. being associated with desired findings).

Agreements and disagreements with other studies or reviews

This updated review has a new conclusion compared to the review published in 2012 (Stoffers-Winterling 2012). The 2012 review concluded that there were indications of beneficial effects for psychological therapies for BPD core pathology and associated general psychopathology. The overall findings supported a substantial role for psychotherapy in the treatment of people with BPD. However, the authors also reported that the treatments did not have a very robust evidence base, as there were some concerns regarding the quality of individual trials, and therefore indicated a need for replication trials (Stoffers-Winterling 2012). Following the update of this review, we are now able to state, for the first time, that BPD-specific psychotherapy seem to be better than usual or control treatments for reducing BPD severity in persons affected by BPD, with effect sizes of clinical relevance. This change in conclusion may result from the following: in 2012, only 28 trials were available for inclusion, and any comparisons were done on treatment approach levels. This means that the review authors did not pool any kind of BPD-specific treatment, only DBT, MBT and so on. This new review has used updated methods, including a broader search strategy, and thus a new protocol was published in 2018 (Storebø 2018). What is more, this version is the first to include the required information sizes, for at least some comparisons, on the level of BPD-specific approaches in general (see Summary of findings 1), allowing for drawing conclusions on a much more reliable basis.

Our review is in partial agreement with the review by Cristea and colleagues who found that psychotherapy, especially DBT and psychodynamic approaches, are effective for borderline symptoms and related problems (Cristea 2017). Similarly, we found that psychotherapy appears to be more effective than usual treatment at improving BPD symptoms; however, we found no clear differences between the various treatments. We agree that DBT treatments in particular, seem to have a more robust evidence base, due to more clinical trials having been conducted. This discrepancy in conclusions may be due to differences in methodological approach. The study by Cristea and colleagues searched for data in only four databases and included only one publication per trial. They also did not use subsamples of persons with BPD and did not perform an assessment of the overall quality of the evidence. Taken together these limitations suggest that their conclusions may be too optimistic (Faltinsen 2017).

Matthijs Oud and colleagues published a review in 2018 (Oud 2018), which investigated the effects of specialised psychotherapy for BPD. In contrast to our review, they focused on four BPD-specific treatments (DBT, MBT, SFT, and TFP) and only included adult samples, resulting in the inclusion of 20 trials. In line with the findings of this review, they reported moderate-quality evidence that psychotherapy is effective in reducing overall BPD severity (SMD of −0.59 compared to our SMD of −0.52). We took a broader approach and included all types of psychotherapy conducted in participants of all ages, which resulted in a more complete picture of the area with a larger evidence base (Oud and colleagues included only 321 participants in their analysis of BPD severity compared to 1244 participants in our analysis of the same outcome).

AUTHORS' CONCLUSIONS

Implications for practice

The interventions included in this review represent a broad spectrum of therapies, covering cognitive-behavioural therapy (CBT), dialectical behavioural therapy (DBT), DBT skills group, eclectic therapy, psychodynamic therapy, systems training for emotional predictability and problem-solving (STEPPS), schema-focused therapy (SFT), interpersonal psychotherapy and mentalisation-based therapy.

Analyses showed beneficial effects of psychotherapy compared to TAU for all primary outcomes. However, only the improvement in BPD severity reached the level of a clinically important improvement compared to the MIREDIF; we considered this to be moderate-quality evidence, meaning that additional research could impact our confidence in the effect estimate and may change the estimate. All trials had a high risk of bias and, for most outcomes, we considered the data to be of low quality due to imprecision, small sample sizes and inconsistency.

We found no unequivocal, high-quality evidence to support one BPD-specific therapy over another in the treatment of BPD; our subgroup analyses showed no differences in effect estimates between the different types of therapies. However, compared to TAU, we observed significant effects in favour of DBT for the primary outcomes of BPD severity, self-harm and psychosocial functioning, and in favour of MBT for self-harm, suicidality and depression. We rated the quality of the evidence for these outcomes as low, meaning that the true magnitude of these effects is uncertain.

In relation to implications for practice, low-certainty evidence shows that that BPD-tailored therapies (like DBT, MBT, CBT, SFT, TFP and ACT) may be more effective than usual treatments. We

must await ongoing and new trials that can compare more validly the different treatment effects for the various types of treatment for BPD, including head-to-head comparisons. Current evidence indicates that psychotherapy, especially BPD-tailored approaches, have beneficial effects on a variety of outcomes. However, only the decrease in BPD symptom severity was found to be clinically important. In order to help people affected by BPD decide on treatment according to their preferences and values, they should be informed about the variety of treatments available, working models, treatment durations and related information.

Though a subgroup analysis indicated that adolescents may benefit less from psychotherapy compared to adults regarding overall BPD severity, this finding is based on low-quality evidence only and very few observations (only two RCTs of adolescents included; Analysis 27.1.1), so the true effect remains uncertain. In practice, many adolescents often present with BPD symptoms on a subthreshold level, not yet reaching the full diagnostic threshold for BPD. Subthreshold BPD symptoms (even with only one BPD feature present) have been shown to be clinically important and correlated with the presence of mental state disorders, reduced social functioning and suicidal behaviour (Thomson 2019). Therefore, RCTs on early intervention for BPD in adolescence often include participants with subthreshold BPD. We have not included such participants in this review despite accumulating research findings that support the conduct of early interventions (Chanen 2016; Chanen 2018).

Implications for research

In order to thoroughly investigate the efficacy of the treatments described in this review, there is a need for further high-quality RCTs with larger patient groups. Here, it is essential that individual researchers are not involved in the delivery or the development of the treatment being investigated. Additionally, to assess the efficacy of psychotherapeutic treatments in BPD, there is a need for a greater consensus on what constitutes the core outcomes of BPD. Here, the selection of outcomes should be based on what people with BPD and their caregivers consider to be of value. Besides the core symptoms of BPD, which are still included in the DSM-5 (APA 2013) and will be retained in ICD-11 (WHO 2018), the dimensional outcome domains of personality disorders should also be considered, as this would foster the applicability of BPD research to non-BPD personality disorders. Furthermore, assessment of outcomes should be based on validated, universal scales that enable a comparison of treatment effects between trials. Fortunately, BPD-specific measures have been developed and used more often during the past decade. Yet for some important BPD-specific outcomes (like 'avoidance of abandonment', 'feeling of emptiness'), assessment still relies on single items of questionnaires (like the Zan-BPD (Zanarini 2003a) or BPDSI-IV (Arntz 2003)). The development of validated assessments tools would be helpful.

Future trials should include standardised control interventions that are carefully considered and reported fully in order to get a clear picture of what the psychological therapies are being compared to. More research is needed, when it comes to understanding the effects of interventions in certain groups of people, especially adolescents and the elderly, but also in men who are still under-represented in BPD research. Long-term trials should be conducted in order to understand which treatment effects are maintained and which diminish over time.

Our findings that different BPD-specific treatments are helpful is certainly in line with all-day experiences of clinicians. There are some interventions beyond the prominent paradigms for which we found encouraging results and that deserve further attention. These especially include add-on therapies such as STEPPS and ERGT. Though the different treatment approaches are theoretically divergent and postulate different mechanisms of change (Gunderson 2018), analyses of the technical aspects reveal many commonalities in terms of structure, focus and interventions, including general factors across therapies such as a structured treatment framework, consistent focus on the therapeutic relationship, active therapists and therapist support (Bateman 2015; De Groot 2008; Kongerslev 2015; Weinberg 2011). However, more research is needed to understand the shared mechanisms of these specialist treatments, and how they contribute to change in BPD symptomatology (Karterud 2020). Future RCTs should consider incorporating measurements of diverse mechanisms of change that are known to be generally effective across therapies and diagnoses (e.g. focusing on the working alliance). This would allow for investigating the role of general mechanisms of change across different treatments in terms of outcome (Chatoor 2001; Kazdin 2009).

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Amianto 2011

Study characteristics	
Methods	12-month trial with 2 arms 1. Supervised team management (STM) 2. STM + sequential brief Adlerian psychodynamic psychotherapy (SB-APP) **Duration of trial:** 10-12 months intervention, 1 year follow-up **Country:** Italy **Setting:** outpatient, the Mental Health Center of Chivasso, Turin
Participants	**Method of recruitment of participants:** screened through clinical notes of outpatient mental health service. Patients who had been treated and clinically managed at least 1 year were eligible. **Overall sample size:** 35 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR)

Amianto 2011 *(Continued)*

Means of assessment: Structured Clinical Interview for DSM (SCID)
Mean age: 39.5 years (standard deviation = 9.4; range = 24-57)
Sex: not stated
Comorbidity: of all the included participants, only 13 participants (37.1%) did not show a comorbid Axis I diagnosis.

Inclusion criteria

1. Borderline Personality Disorder diagnosis according to Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR) criteria
2. Aged between 20-50 years
3. Heavy use of mental health services throughout the prior year
4. Absence of an acute comorbid Axis I disorder requiring hospitalisation
5. No current substance dependence disorder
6. No mental retardation
7. No previous psychotherapy interventions
8. Valid informed consent

Exclusion criteria

1. Acute Axis I disorder requiring hospitalisation
2. Mental retardation
3. Substance dependence

Interventions

Experimental group
Treatment name: supervised team management (STM) + sequential brief Adlerian psychodynamic psychotherapy (SB-APP)
Number randomised to group: 18
Duration: 12 months

Control/comparison group
Comparison name: STM only
Number randomised to group: 17
Duration: 12 months

Both groups

Concomitant psychotherapy: supervised team management (STM) includes unstructured psychological support focused on socio-relational impairment as well as rehabilitative interventions and mental health services training.
Concomitant pharmacotherapy: supervised team management (STM) includes medications that were administered according to American Psychiatric Association (APA) guidelines for borderline personality disorder. Three classes of drugs were used: antidepressants, mood stabilisers and atypical antipsychotics. Drug treatment was prescribed during the first or second visit and modified if necessary during follow-up.

Proportions of participants taking standing medication during trial observation period: No further information on pharmacotherapy

Outcomes

Primary

1. Borderline personality disorder severity, assessed by the Clinical Global Impression Scale (CGI)
2. Self-harm, assessed by the number of self-harm incidents reported
3. Suicide-related outcomes, assessed by the the Clinical Global Impression - Modified (CGI-BPD) item on suicidality and self-damaging acts
4. Psychosocial functioning, assessed by the Glocal Assessment of Functioning

Secondary

1. Anger, assessed by the CGI-BPD item on anger

Amianto 2011 *(Continued)*

2. Affective instability, assessed by the CGI-BPD item on affective instability
3. Chronic feeling of emptiness, assessed by CGI-BPD item on a feeling of chronic emptiness
4. Impulsivity, assessed by the CGI-BPD item on impulsivity
5. Interpersonal problems, assessed by the CGI-BPD item on disturbed relationships
6. Abandonment, assessed by the CGI-BPD item on fear of abandonment
7. Identity disturbance, assessed by the CGI-BPD item on identity distortion
8. Dissociation and psychotic-like symptoms, assessed by the CGI-BPD item on dissociative symptoms
9. Attrition, in terms of patients lost after randomisation in each group

Notes	**Sample size calculation:** not stated **Ethics approval:** yes **Comments from review authors:** 1. Small sample size with no power calculation

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Patients, after providing their informed consent, were randomly assigned to SB-APP in addition to Supervised Team Management (STM; number of participants = 18) or to STM alone (number of participants = 17) groups. The random allocation was generated using a random number table and was carried out by one author (BR), who was not involved in patients' clinical management". (p 3).
Allocation concealment (selection bias)	Low risk	**Quote:** "[Randomisation] was carried out by one author (BR), who was not involved in patients' clinical management. Patients were enrolled by a psychiatrist of the MHS who communicated the generalities of the participants who signed the informed consent to BR and received from BR the group assignment. The treatment allocation was assured by both psychiatrist and psychotherapist....Treatments of each branch were conducted simultaneously and both started the week after the enrollment in the study" (p 4).
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** The raters were blind with regard to the group assignment of patients.
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** Intention-to-treat (ITT) analysis was used, dropout rates were low and balanced across groups.
Selective reporting (reporting bias)	Low risk	**Comment:** ITT, low dropout that was balanced in each group
Other bias	High risk	**Treatment adherence:** Adherence to Sequential Brief Adlerian Psychodynamic Psychotherapy (SB-APP) technique was monitored. However, no results of adherence scores were published. **Allegiance bias:** SB-APP was developed by some of the authors. **Attention bias:** "The number of sessions performed by the two groups in the first year (T0-T12) was planned to be comparable, reducing the bias about the number of sessions". **Vested interest:** No funding was received by any author to perform the present research which was introduced within the ordinary activities of the Chivasso MHS therapeutic team.

Andreoli 2016

Study characteristics	
Methods	3-month duration trial with 3 arms 1. Abandonment psychotherapy (AP-P) 2. Abandonment psychotherapy delivered by nurses (AP-N) 3. Intensive community treatment-as-usual (TAU, control) **Duration of trial:** 3 months **Country:** Switzerland **Setting:** community and hospital
Participants	**Method of recruitment of participants:** consecutive patients entering the emergency room of the Geneva (Switzerland) Cantonal University Hospital were screened for deliberate self-harm by specialised emergency room nurses. **Overall sample size**: 107 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, (DSM-IV) **Means of assessment:** International Personality Disorder Examination (IPDE; Loranger 1995) **Mean age:** 31.9 years (standard deviation = 10.1) **Sex:** 84.1% female **Comorbidity:** major depressive disorder (MDD), substance abuse (10.6%), alcohol dependence (4.1%), alcohol abuse (21.8%) **Inclusion criteria** 1. 18-60 years old 2. Met Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, (DSM-IV) criteria for major depressive disorder (MDD) and borderline personality disorder **Exclusion criteria** 1. Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, (DSM-IV) psychotic disorder, bipolar I disorder, severe substance dependence, mental retardation 2. Inability to speak French 3. Any medical condition precluding antidepressant medication or likely to significantly influence psychiatric outcome
Interventions	**Experimental group 1** **Treatment name:** abandonment psychotherapy (AP-P) **Number randomised to group:** 70 **Duration:** 3 months **Experimental group 2** **Treatment name:** abandonment psychotherapy delivered by nurses (AP-N) **Number randomised to group:** 70 **Duration:** 3 months **Both experimental groups** **Concomitant psychotherapy:** When therapists were not available, participants could call the 24-hour emergency room hotline and receive emergency care from the psychiatric staff of the general hospital. **Concomitant pharmacotherapy:** Abandonment psychotherapy was applied in combination with an antidepressant medication protocol. Antidepressant medication was prescribed in a standard clinical management format by a psychiatrist who was blind to treatment choice. Most patients (n = 125, 89.3%) were prescribed venlafaxine, with an initial 0.5 mg/kg dosage and an optimal 2 to 3 mg/kg

Andreoli 2016 *(Continued)*

dosage. Repeated drug plasma level monitoring was performed at 2 weeks, 1 month, and 2 months to control for compliance. Venlafaxine was chosen because locally it was the medication most frequently prescribed among these patients. Additional mild neuroleptic medication (quetiapine 25 to 75 mg/day) was occasionally prescribed for brief periods, mostly limited to the first weeks of treatment. Not specified which exact proportions of participants received medication in each group

Control/comparison group
Comparison name: intensive community treatment-as-usual
Number randomised to group: 30
Duration: 3 months

Concomitant psychotherapy: Treatment-as-usual included as many nurse visits as required for two weeks and biweekly thereafter, weekly clinical review and medication adjustment from a psychiatrist, group therapy, social worker support, and as much day care, night hospitalisation and family intervention as needed to deal with suicidal relapse, emergency response.
Concomitant pharmacotherapy: weekly clinical review and medication adjustment

Proportions of participants taking standing medication during trial observation period: "The rate of subjects who were prescribed an antidepressant medication was lower in the TAU group compared to the AP groups (AP-P: 68, 97.1%; AP-N: 68, 97.1%, TAU: 23, 76.7%; Fisher's exact test: $p < .003$), but the mean number of days spent in antidepressant treatment (AP-P: 89.6, *SD* 32.9; AP-N: 81.8, *SD* 36.7; TAU: 70.7, *SD* 55.9) and the number of participants who completed antidepressant treatment (AP-P: 47, 67.1%; AP-N: 48, 68.6%; TAU: 17, 56.7%) did not differ in the treatment cells. Among patients assigned to AP, the number of days spent in antidepressant medication and venlafaxine plasma levels did not differ as a function of type of therapist delivering AP" (Andreoli 2016, p. 280).

"The analyses were repeated using […] presence of antidepressant medication, number of days spent in antidepressant medication, […] as covariates […]: the results were not materially altered." (Andreoli 2016, p. 283)

"...when we statistically controlled for the presence of additional antidepressant medication, the observed between-group differences held." (Andreoli 2016, p.285)

Outcomes

Primary

1. Suicide-related outcomes, defined as number of suicidal ideations
2. Mental health status, assessed by the Global Assessment Scale

Secondary

1. Depression, assessed by the Hamilton Depression Rating Scale - 17 items
2. Attrition, in terms of patients lost after randomisation in each group
3. Adverse effects

Notes

Sample size calculation: yes

Ethics approval: yes

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** Eligible participants were randomly allocated to treatment by a researcher not involved in the treatment procedures. This was done using a pre-generated block randomisation scheme developed and held by a statistician, who prepared two series of sealed envelopes.
Allocation concealment (selection bias)	Low risk	**Comment:** Treatment allocation was masked to clinicians through sealed envelopes in charge of the treatments.

Andreoli 2016 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** Subjects were assessed at intake and at 3-month follow-up by well- trained psychologists with clinical experience who were blind to treatment assignment.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** Intention-to-treat analysis was used and there were relatively low numbers of dropouts. However, the attrition rate was higher in TAU (16.7% who did not come to treatment and 20% who terminated their treatment early) compared to intervention (AP-P: 5.7% and AP-N: 2.9% who did not come to treatment and AP-P: 5.7% and AP-N: 2.9% who terminated their treatment early). Thus, attrition rates were not balanced between intervention groups and control group.
Selective reporting (reporting bias)	High risk	**Comment:** The authors provided no data on the Hamilton Depression Rating Scale 17 items (HDRS-17: Hamilton, 1960), even though it was stated as an outcome.
Other bias	High risk	**Treatment adherence:** No data were provided on the Hamilton Depression Rating Scale 17 items (HDRS-17: Hamilton, 1960), even though it was stated as an outcome. **Allegience bias:** It was unclear who developed the manual for abandonment psychotherapy. It was however mentioned that the developers of the manual were involved in supervision p. 275. **Attention bias:** TAU patients seem to have received more attention given the inpatient treatment. With regards to medication, the intervention groups had received more antidepressants. **Vested interest:** Unclear who developed manual for abandonment psychotherapy, but there were no clear indications of vested interest.

Antonsen 2017

Study characteristics	
Methods	Approximately 18-week trial with 2 arms 1. Short-term day hospital psychotherapy 2. Outpatient individual psychotherapy **Duration of trial:** 18 weeks **Country:** Norway **Setting:** inpatient and outpatient
Participants	**Method of recruitment of participants:** Participants were referred to the respective departments as stated in the individual trials. **Overall sample size:** 52 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM, version 2 (SCID-II) **Mean age:** 29 years (standard deviation = 6.7) **Sex:** 85% female

Antonsen 2017 *(Continued)*

Comorbidity: The distribution of personality disorder (PD) diagnoses was as follows: borderline personality disorder (46%); avoidant personality disorder (40-41%); personality disorder not otherwise specified (21%); paranoid personality disorder (15%-14%); obsessive compulsive personality disorder (9%); dependent personality disorder (7%); narcissistic personality disorder (2%); and schizoid personality disorder (1%). The patients had a mean of 3.4 symptom disorders: 74% with major depression; 37% with dysthymia; 8% with bipolar II disorder; 46% with panic disorder; 47% with social phobia; 12% with obsessive compulsive disorder; 48% with general anxiety disorder; 27% with substance misuse disorders; and 14% with eating disorder

Inclusion criteria

1. Patients with personality disorders

Exclusion criteria

1. Schizotypal personality disorder
2. Antisocial personality disorder
3. Ongoing alcohol or drug dependence
4. Psychotic disorders
5. Bipolar I disorder
6. Untreated attention deficit hyperactivity disorder (ADHD) (adult type)
7. Pervasive developmental disorder (e.g. Asperger's syndrome)
8. Organic syndromes
9. Being homeless

Interventions

Experimental group
Treatment name: combination program (CP) of short-term day hospital psychotherapy (DHP) followed by outpatient combined individual and group psychotherapy
Number randomised to group: 27
Duration: 18 weeks

Control/comparison group
Comparison name: outpatient individual psychotherapy (OIP)
Number randomised to group: 25
Duration: 18 weeks

Both groups

Concomitant psychotherapy:

The outpatient treatment consisted of weekly group therapy (1.5 hours) for a maximum of 4 years, combined with weekly individual therapy for a maximum of 2.5 years.

Concomitant pharmacotherapy:

All patients received optional psychopharmacological consultations with a psychiatrist as part of the follow-up evaluations.

Proportions of participants taking standing medication during trial observation period:

"Patients in the CP tended to use less psychotropic medications over time compared with the OIP, but the difference was not statistically significant (p = .09)." (Antonsen 2017; p. 57)

Outcomes

Primary

1. Mental health status (psychosocial functioning), assessed using the Global Assessment of Functioning Scale

Secondary

1. Interpersonal problems, assessed with the Circumplex of Interpersonal Problems (self-reported)
2. Depression, assessed by the Beck Depression Inventory

Antonsen 2017 *(Continued)*

3. Attrition, in terms of patients lost after randomisation in each group

Notes	**Sample size calculation:** yes (in prior studies) **Ethics approval:** yes **Comments from review authors:** 1. We emailed the authors in 2016 and asked for subsample data on borderline personality disorder (BPD). We received information that they did not have these data; however, they sent us information about an article with follow-up data on borderline personality disorder (BPD)-only patients.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "Patients meeting the entry criteria [...] were consecutively randomly allocated to either day hospital psychotherapy (DHP) [i.e., CP] or outpatient individual psychotherapy (OIP)" (p 72).
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear details were provided by the authors.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no clear details were provided by the authors.
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** attrition rates were 14% and 8% attrition rates in the groups. This difference was not statistically significant. ITT analysis was used. The reasons for missing data were similar between groups.
Selective reporting (reporting bias)	High risk	**Comment:** Self-esteem, self-destructive behavior, personality pathology, healthcare utilisation, affect consciousness, and reflective functioning included in trial registration and not in Arnevik 2009.
Other bias	High risk	**Treatment adherence:** day hospital psychotherapy (DHP) "However, there was no formal training for the therapists, nor did the guidelines serve as a standard for treatment adherence." (p 72) OIP: "The researchers gave no instructions to the OIP therapists regarding the duration and intensity of psychotherapy, nor did they interfere with any treatment decisions in the OIP conditions." (p 72) **Allegiance bias:** no obvious risk of bias **Attention bias:** Similar total length. Frequency of therapy from once a month to three times a week in OIP. Frequency of therapy in groups were different (not reported in Arnevik, 2009). There was an obvious difference in the amount of therapy received. CP patients received 18 weeks' intensive day hospital treatment followed by conjoint treatment, while in OIP, most patients attended therapy once a week. The mean number of participants who received therapy sessions at 18 months in OIP was 40. (Arnevik 2010, p 199)

Bateman 1999

Study characteristics

Methods	Randomised controlled trial with 2 arms for 18 months

Bateman 1999 *(Continued)*

1. Partial hospitalised group receiving mentalisation-based therapy
2. Standard psychiatric care

Duration of trial: up to 18 months

Country: UK

Setting: partially hospitalised/outpatient

Participants	**Method of recruitment:** Patients referred **Overall sample size:** 38 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 3rd revision (DSM-III-R) **Means of assessment:** both Structured Clinical Interview for DSM-IV personality disorders (SCID) and Revised Diagnostic Interview for Borderlines (DIB-R) **Mean age:** 31.8 years **Sex:** 57.9% female **Comorbidity**: In terms of axis I diagnosis, 70% and 62% had major depression in the intervention and control group, respectively. **Inclusion criteria:** 1. Patients diagnosed with borderline personality disorder **Exclusion criteria** 1. Schizophrenia 2. Bipolar disorder 3. Substance misuse 4. Mental impairment 5. Evidence of organic brain disorder
Interventions	**Experimental group** **Treatment name:** mentalisation-based treatment (MBT) **Number randomised to group:** 19 **Duration:** up to 18 months **Control/comparison group** **Comparison name:** standard treatment in the general psychiatric services **Number randomised to group**: 19 **Duration:** up to 18 months **Both groups** **Concomitant psychotherapy:** none **Concomitant pharmacotherapy:** antidepressant and antipsychotic drugs prescribed, as appropriate, polypharmacy was discouraged **Proportions of participants taking standing medication during trial observation period:** "The initial types and doses of medication were the same for both groups." (Bateman 1999, p. 1565)

Bateman 1999 *(Continued)*

	Exact medication use during treatment unclear: higher medication costs in control group (z-3.9, P < 0.001) (Bateman 2003, Tab. 1, p. 170) indicates more frequent use of medications in the control group.
Outcomes	**Primary** 1. Number of patients with self-harming behaviour in the last 6-month period 2. Number of patients with suicide attempts in the last 6-month period Both outcomes assessed with the Suicide and Self-Harm Inventory, a semi-structured interview. **Secondary** 1. Interpersonal problems, assessed with the Inventory of Interpersonal Problems 2. Depression, assessed with the Beck Depression Inventory
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** 1. Per protocol (22 randomised to each group, only 19 per group analysed since treated per protocol) 2. Information about randomisation and allocation procedure, as well as blinding, was received by email from Dr Bateman.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comments:** Did not use a minimisation method. This method is used to minimise the imbalance between the number of patients in each treatment group. This method maintains a better balance than traditional blocked randomisation, and its advantage increases with the number of stratification factors. It is reported that random assignment was used but it is unclear how the random assignment was performed.
Allocation concealment (selection bias)	Low risk	**Comment:** Allocation was completed centrally at the university.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** Outcome assessors were blind to intervention group.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** Analyses were based on completers only.
Selective reporting (reporting bias)	Unclear risk	**Comment:** There was no clear indication of selective reporting, but there was insufficient information to permit judgement of 'high' or 'low'.
Other bias	High risk	**Attention bias:** more attention paid to experimental group participants **Allegiance bias:** there was no indication given for an allegiance effect. However, as both authors are the founders of MBT, the treatment actually used in the experimental group, an allegiance effect seems not improbable. **Adherence bias:** "All sessions were audiotaped. Adherence to the treatment manuals was determined by randomly selected audiotapes of individual and group sessions drawn from two distinct 6-months periods of each case using

Bateman 1999 *(Continued)*

	a modified version of the recommended adherence rating scale." (Bateman 2009, online data supplement, p 1)

Bateman 2009

Study characteristics	
Methods	Randomised controlled trial with 2 arms for 18 months 1. Mentalisation based treatment 2. Structured clinical management **Duration of trial:** 18 months **Country:** UK **Setting:** outpatient
Participants	**Methods of recruitment of patients:** consecutive referrals **Overall sample size:** 168 **Diagnosis of Borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured and Clinical Interview for DSM axis II disorders **Mean age:** 31.3 years (standard deviation = 7.6) **Sex:** 79.9% females **Comorbidity:** comorbid antisocial personality disorder **Inclusion criteria** 1. Diagnosis of borderline personality disorder 2. Suicide attempt or episode of life-threatening self-harm within last 6 months 3. Age 18–65 years **Exclusion criteria** 1. Psychotic disorder 2. Bipolar I disorder 3. Opiate dependence requiring specialist treatment 4. Mental impairment 5. Evidence of organic brain disorder 6. Being in long-term psychotherapeutic treatment
Interventions	**Experimental group** **Treatment name:** mentalisation-based therapy **Number randomised to group:** 71 **Duration:** 18 months **Control/comparison group** **Comparison name:** structured clinical management **Number randomised to group:** 63

Bateman 2009 *(Continued)*

	Duration: 18 months **Both groups** **Concomitant psychotherapy:** patients already in long-term psychotherapeutic treatment were not eligible. **Concomitant pharmacotherapy:** patients were prescribed medication according to the American Psychological Association (APA) guidelines; all patients were offered medication reviews every 3 months. **Proportions of participants taking standing medication during trial observation period:** MBT group: 29.6%, control group 57.1%; group effect over time: IRR 0.77, P < 0.001 (less medication use in MBT group)
Outcomes	**Primary:** 1. Suicidal ideation, assessed by the number of patients with suicide attempt in the previous 6-month period 2. Self-harming behaviour, assessed by the number of patients with self-harming behaviour in the previous 6-month period 3. Mental health status, assessed with the Global Assessment of Functioning **Secondary**: 1. Interpersonal problems, assessed with the Inventory of Interpersonal Problems–circumflex version 2. Depression, assessed with the Becks Depression Inventory
Notes	**Sample size calculation:** yes **Ethic approval:** The study was approved by Barnet Enfield and Haringey Local Research and Ethics Committee and conducted at the Halliwick Personality Disorder service and in a community outpatient facility. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "randomization using a stochastic minimization program (MINIM) balancing for age (blocked as 18-25, 26-30, > 30 years), gender, and presence of antisocial personality disorder." (Bateman 2009, p 1357)
Allocation concealment (selection bias)	Low risk	**Quote:** "Treatment allocation was made offsite [...] A study psychiatrist informed patients of their assignment." (Bateman 2009, p. 1357)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Assessors were blind to treatment group." (Bateman 2009, p 1358)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** ITT analyses were used by the authors.
Selective reporting (reporting bias)	Low risk	**Comment:** A study protocol is available (ISRCTN27660668); there was no indication of selective reporting.
Other bias	High risk	**Adherence bias:** "All sessions were audiotaped. Adherence to the MBT-OP and SCM-OP manuals was determined by randomly selected audiotapes of individual and group sessions drawn from two distinct 6-months periods of each case

Bateman 2009 *(Continued)*

	using a modified version of the recommended adherence rating scale." (Bateman 2009, online data supplement, p 1) **Allegiance bias:** There was no indication given for an allegiance effect. However, as both authors are the founders of MBT, the treatment actually used in the experimental group, an allegiance effect seems not improbable. **Attention bias:** Equal amounts of attention paid to both groups

Bellino 2006

Study characteristics	
Methods	Randomised controlled trial with 2 treatment arms 1. Fluoxetine + interpersonal therapy 2. Fluoxetine + clinical management **Duration of trial:** 24 weeks **Country:** Italy **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Overall sample size:** 39 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text-Revision (DSM-IV-TR) **Means of assessment:** Structured Clinical Interview for Personality Disorders **Mean age:** 26.4 years (standard deviation = 3.7) **Sex:** 60% female **Comorbidity:** comorbid diagnosis of mild to moderate major depressive episode required for inclusion **Inclusion criteria** 1. Patients with a diagnosis of borderline personality disorder **Exclusion criteria** 1. Lifetime diagnosis of delirium 2. Dementia 3. Amnestic or other cognitive disorders 4. Schizophrenia or other psychotic disorders 5. Patients whose major depressive episode was an expression of bipolar disorder 6. Current diagnosis of substance abuse disorder 7. Treatment with psychotropic drugs or psychotherapy during the 2 months prior to the study 8. Female patients not using an adequate method of birth control
Interventions	**Experimental group** **Treatment name**: fluoxetine + interpersonal therapy (IPT) **Number randomised to group:** 19

Bellino 2006 *(Continued)*

	Duration: 24 weeks (1 weekly session) **Control/comparison group** **Comparison name:** fluoxetine + clinical management (CM) **Number randomised to group:** 20 **Duration:** 24 weeks (CM; 6 appointments, first two fortnightly, monthly afterwards) **Both groups** **Concomitant psychotherapy:** patients who received psychotherapy during the 2 months prior to the study were not eligible. **Concomitant pharmacotherapy:** all study participants received 20 to 40 mg fluoxetine daily; patients with psychotropic treatment during the 2 months prior to the study were not eligible for inclusion. **Proportions of participants taking standing medication during trial observation period:** 100% of each group were taking fluoxetine (see above)
Outcomes	**Primary** 1. Mental health status, assessed with the the Clinical Global Impressions scale **Secondary** 1. Depression, assessed with the Hamilton Depression scale
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** 1. Information about randomisation and allocation procedure, as well as about treatment adherence, was received by email from Dr Bellino.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** The authors used a computer random number generator (Bellino 2006) [pers comm].
Allocation concealment (selection bias)	Low risk	**Comment:** Allocation was by central allocation (Bellino 2010c [pers comm].
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "assessments were performed by an investigator who was blind to the treatment methods" (Bellino 2006, p. 455).
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors conducted a completer analysis. **Quote:** "Owing to noncompliance, 7 patients discontinued treatment during the first 3 weeks,. Of these individuals, 4 were in the medication-only group, and 3 were in the combined therapy group. We performed analyses on the 32 patients [...] who completed the 24 weeks of treatment." (Bellino 2006, p. 455)
Selective reporting (reporting bias)	Unclear risk	**Comment:** No clear indication for selective reporting, but Insufficient information to permit a judgement of 'high' or 'low'

Bellino 2006 *(Continued)*

Other bias	High risk	**Adherence bias:** "[...] psychotherapist [....] had 5 years of experience practising IPT" (Bellino 2006, p. 455). No specific measures to monitor treatment adherence (Bellino 2010a [pers comm]) **Allegiance bias:** The authors seemed not to be associated with IPT. **Attention bias:** More attention paid to EG participants

Bellino 2007

Study characteristics	
Methods	Randomised controlled trial with 2 treatment arms 1. Fluoxetine + interpersonal therapy 2. Fluoxetine + cognitive therapy **Duration of trial:** 24 weeks **Country:** Italy **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 32 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for Personality Disorders (SCID) **Mean age:** 30.55 years (standard deviation = 5.75) **Sex:** 63.2% females **Comorbidity:** comorbid diagnosis of mild to moderate major depressive episode required for inclusion **Inclusion criteria** 1. Patients diagnosed with borderline personality disorder **Exclusion criteria** 1. Lifetime diagnosis of delirium 2. Dementia 3. Amnestic or other cognitive disorders 4. Schizophrenia 5. Other psychotic disorders 6. Patients whose major depressive episode was an expression of bipolar disorder 7. Current diagnosis of substance abuse disorder 8. Treatment with psychotropic drugs or psychotherapy during 2 months prior to study 9. Female patients of child-bearing age not using adequate method of birth control
Interventions	**Experimental group** **Treatment name:** fluoxetine + interpersonal therapy (IPT) **Number randomised to group:** 16

Bellino 2007 *(Continued)*

	Duration: 24 weeks (1 weekly session) **Control/comparison group** **Comparison name:** fluoxetine + cognitive therapy **Number randomised to group:** 16 **Duration:** 24 weeks (1 weekly session) **Both groups** **Concomitant psychotherapy:** patients who received psychotherapy during the 2 months prior to the study were not eligible. **Concomitant pharmacotherapy:** all study participants received 20 to 40 mg fluoxetine daily, with 7 appointments, the first 2 fortnightly and the last 5 monthly; patients with additional current psychotropic treatment were not eligible for inclusion. **Proportions of participants taking standing medication during trial observation period:** 100% of each group were taking fluoxetine (see above).
Outcomes	**Primary** 1. Mental health status, assessed with the Clinical Global Impression scale **Secondary** 1. Depression, assessed with the Hamillton Depression scale
Notes	**Sample size calculation:** not stated **Ethics approval:** had ethics board approval and followed Declaration of Helsinki guidelines **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Patients [...] were randomized using the web program Research Randomizer v3.0 (Urbaniak & Plous, Social Psychology Network, 2007)" (Bellino 2007, p. 720).
Allocation concealment (selection bias)	Low risk	**Comment:** Allocation was conducted centrally (Bellino 2010 [pers comm]).
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** "A psychiatrist provided pharmacotherapy. He was blind to which type of psychotherapy the patients were receiving [...] The assessments were performed by an investigator who was blind to the treatment methods." (Bellino 2007, p. 720)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors conducted a completer analysis. **Quote:** "Initially, there were 32 patients enrolled in the study. [...] Owing to noncompliance, 6 patients discontinued treatment during the first 3 weeks. Of these subjects, 2 were in the IPT group, and 4 were in the CT group. We performed statistical analyses of outcome measures on the 26 patients [...] who completed the 24 weeks of treatment." (Bellino 2007, p. 720)
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication for selective reporting, but Insufficient information to permit judgement of 'Yes' or 'No'

Bellino 2007 *(Continued)*

Other bias	Low risk	**Adherence bias:**"Both psychotherapists received supervision during the treatment to assess their adherence to the psychotherapy manuals." (Bellino 2007, p. 720) **Allegiance bias:** The authors seemed neither to be associated to IPT nor CT. **Attention bias:** Equal amounts of attention paid to both groups

Bellino 2010

Study characteristics	
Methods	Parallel-arm, randomised controlled trial with 2 treatment arms 1. Combined therapy + fluoxetine 2. Fluoxetine **Duration of trial:** 32 weeks **Country:** Italy **Setting:** outpatient
Participants	**Methods of recruitment of participants:** participants recruited from patients attending the Service for Personality Disorders of the Unit of Psychiatry 1, Department of Neurosciences, University of Turin, Italy **Sample size:** 55 **Diagnosis of borderline personality disorder diagnosis:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for Personality Disorders (SCID) **Mean age:** combined therapy + fluoxetine = 26.23 years (standard deviation = 6.4), fluoxetine = 25.86 years (standard deviation = 7.2) **Sex:** 67.3% female **Comorbidity**: participants had no comorbid axis-I or II comorbidities **Inclusion criteria** 1. Patients with borderline personality disorder **Exclusion criteria** 1. Concomitant diagnoses of Axis I or Axis II disorders 2. Schizophrenia or other psychotic disorders 3. Bipolar disorder 4. Lifetime diagnosis of delirium 5. Dementia 6. Amnestic disorder 7. Other cognitive disorders 8. Not using adequate methods of birth control if in childbearing age 9. Receiving psychotropic drugs during last 2 months 10.Psychotherapy in last 6 months
Interventions	**Experimental group**

Bellino 2010 *(Continued)*

Treatment name: combined therapy of fluoxetine (20 to 40 mg/d) plus weekly individual Interpersonal therapy adapted to borderline personality disorder (IPT-BPD)

Number randomised to group: 27

Duration: 32 weeks

Control/comparison group

Comparison name: single pharmacotherapy treatment with fluoxetine plus TAU (treatment approach of patients attending the Service for Personality Disorders. A visit lasting 15 to 20 minutes was provided every 2 weeks, dealing with clinical issues)

Number randomised to group: 28

Duration: 32 weeks ((20 to 40 mg/d) + clinical management (medical appointments lasting 15 to 20 minutes every 2 weeks, dealing with clinical issues)

Both groups

Concomitant psychotherapy: eligible patients were not in psychotherapeutic treatment during the last 6 months prior to study entry.

Concomitant pharmacotherapy: eligible patients were not receiving psychotropic drugs during the last two months prior to study entry.

Proportions of participants taking standing medication during trial observation period: 100% of each group were taking fluoxetine (see above).

Outcomes

Primary

1. Borderline Personality Disorder severity, assessed with the Borderline Personality Disorder Severity Index (BPDSI-IV) - total score
2. Self-harming behaviour, assessed with the BPDSI-IV - parasuicidal behaviour subscale
3. Mental health status, assessed with the Clinical Global Impression scale

Secondary

1. Anger, assessed with the BPDSI-IV - anger subscale
2. Affective instability, assessed with the BPDSI-IV - affective instability subscale
3. Chronic feelings of emptiness, assessed with the BPDSI-IV - emptiness subscale
4. Impulsivity, assessed with the BPDSI-IV - impulsivity subscale
5. Interpersonal problems, assessed with the BPDSI-IV - interpersonal relationships subscale
6. Avoidance of abandonment, assessed with the BPDSI-IV - abandonment subscale
7. Identity disturbance, assessed with the BPDSI-IV - identity disturbance subscale
8. Dissociation/stress-related paranoid ideation, assessed with the BPDSI-IV - paranoid ideation subscale
9. Depression, assessed with the Hamillton Depression scale

Notes

Sample size calculation: not stated

Ethics approval: followed the Declaration of Helsinki guidelines and received approval from ethics board

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement

Bellino 2010 *(Continued)*

Random sequence generation (selection bias)	Low risk	**Quote:** "Randomization was performed using the web program Research Randomizer version 3.0 (Urbaniak and Plous, [...])." (Bellino 2010, p. 75)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no further details
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Assessments were performed by an investigator who was blind to the treatment methods." (Bellino 2010, p. 76)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors conducted a completer analysis (IPT-BPD + fluoxetine group: 5 participants lost, CM + fluoxetine group: 6 participants lost).
Selective reporting (reporting bias)	Unclear risk	**Comment:** no clear indication of selective reporting, but Insufficient information to permit judgement of 'high' or 'low'
Other bias	High risk	**Performance bias** **Quote:** "Patients in the IPT-BPD group were treated by a psychotherapist [...] who had at least 5 years of experience practising IPT" (Bellino 2010, p 76). No further information, adherence seems not to have been monitored. **Allegiance bias** **Comment:** The working group seems to be experienced in but not associated with IPT (cf. Bellino 2006; Bellino 2007). **Attention bias:** More attention paid to EG participants

Bianchini 2019

Study characteristics	
Methods	12-month trial with 2 arms: 1. Standard dialectical behavior therapy (DBT) + treatment-as-usual (TAU) within the forensic hospital **Duration of trial:** 12 months **Country:** Italy **Setting:** hospital (forensic)
Participants	**Method of recruitment of participants:** participants recruited from men consecutively detained as patients in three high intensity therapeutic facilities **Sample size:** 21 **Diagnosis of borderline personality disorder:** measured by the Personality Assessment Inventory (Morey 2007) **Means of assessment:** diagnosis confirmed in a clinical interview by a psychiatrist **Mean age:** 41.79 years (standard deviation = 8.14) **Sex:** 100% males **Comorbidity:** not stated

Bianchini 2019 *(Continued)*

	Inclusion criteria 1. Criteria for borderline personality disorder 2. History of violence **Exclusion criteria** 1. Cognitive deficit (intelligence quotient (IQ) < 70) 2. Comorbid neurological diseases
Interventions	**Experimental group** **Treatment name:** DBT + treatment-as-usual **Number randomised to group**: 10 **Duration:** 12 months (once-weekly individual therapy (60 minutes), once-weekly group sessions (120 minutes)) **Concomitant psychotherapy:** treatment-as-usual included social skills, and cognitive remediation **Concomitant pharmacotherapy:** treatment-as-usual included pharmacotherapy **Control/comparison group** **Comparison name**: treatment-as-usual (pharmacotherapy, social skills, cognitive remediation) **Number randomised to group:** 11 **Duration**: 12 months **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** not stated
Outcomes	**Secondary** 1. Affective instability, assessed by the Difficulties in Emotion Regulation Scale, total score 2. Impulsivity, assessed by the Barrett Impulsiveness Scale, total score
Notes	**Sample size calculation:** no **Ethics approval:** The study was approved by the Local Ethic Committee. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "Each pair was randomised into either a group receiving 12 months of DBT along with other therapies available in the high security hospital (pharmacotherapy, social skills, and cognitive remediation) or a group receiving the other usual therapies alone" (pg. 124). No further details provided
Allocation concealment (selection bias)	Unclear risk	**Comment:** the authors did not specify the process of allocation.
Blinding of outcome assessment (detection bias)	Low risk	**Comment:** outcomes were self-reported.

Bianchini 2019 *(Continued)*
All outcomes

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** Dropouts were not explicitly specified. However, the authors stated that "All participants completed at least 90% of the DBT sessions offered." (p.127) Also "Once patients have been admitted […], they are required to complete any treatment programme offered; if a person does not, s/he may be referred back to the magistrate, who must consider if the individual is in breach of his/her order." (p. 123) No details about the proportion of TAU completers, but, since all participants were convicted inpatients of a secure hospital, "completion" of TAU treatment was very likely. "All participants were reassessed after completion of the DBT programme or, for the control group, after the same time had elapsed". (p.125)
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol was available.
Other bias	High risk	**Adherence bias:** therapeutic adherence not assessed **Attention bias:** DBT (once weekly individual plus group therapy) offered additionally to TAU, hence more attention spent to DBT group **Allegiance bias:** there was no indication of allegiance bias.

Blum 2008

Study characteristics	
Methods	Randomised controlled trial with 2 treatment arms 1. Systems Training for Emotional Predictability and Problem Solving 2. Treatment-as-usual **Duration of trial:** 20 weeks **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment:** participants recruited from the University of Iowa inpatient and outpatient psychiatric service **Sample size:** 124 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured Interview for DSMIV Personality (SIDP-IV) **Mean age:** 31.5 years (standard deviation = 9.5) **Sex:** 83.1% female **Comorbidity**: not stated **Inclusion criteria** 1. Patients with borderline personality disorder **Exclusion criteria**

Blum 2008 *(Continued)*

1. Not speaking English
2. Psychotic or primary neurological disorder
3. Cognitively impaired patients
4. Current substance abuse or dependence
5. Participated in STEPPS treatment previously

Interventions	**Experimental group** **Treatment name:** systems training for emotional predictability and problem solving (STEPPS) **Number randomised to group**: 93 **Duration**: 20 weeks (20 × 2-hour weekly group therapy sessions + homework assignments + 1 session for family members or significant others; no individual therapy) **Control/comparison group** **Comparison name**: treatment-as-usual (TAU) **Number randomised to group**: 72 **Duration**: 20 weeks **Both groups** **Concomitant psychotherapy:** participants were encouraged to continue with ongoing concomitant treatments. 59% of all participants had an additional individual therapy. **Concomitant pharmacotherapy:** 90% of participants reported at least one psychotropic medication at baseline; on average. **Proportions of participants taking standing psychotropic medication during trial observation period:** Exact numbers unclear "Psychotropic usage significantly decreased during the 20-week treatment period for both groups (from 2.9 to 1.3 medications per subject), but there was no group difference in level of change (Mann-.2 Whitney test: = 0.1, df = 1, p = 0.782). Thus, medication usage did not confound study results." (Blum 2008; p. 474)
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed with the Borderline Evaluation of Severity Over Time scale (BEST) 2. Mental health status, assessed with the Clinical Global Impression scale (CGI-S) **Secondary** 1. Degres of Impulsivity assessed with the Barratt Impulsiveness Scale 2. Depression, assessed with the Becks Depression Inventory (BDI) 3. Affective instability, assessed with the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD) - affective subscale 4. Interpersonal problems, assessed with the Zanarini Rating Scale for Borderline Personality Disorder - Disturbed Relationships subscale
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:**

Blum 2008 *(Continued)*

1. Information about ethical approval and power calculation was received by email from Dr Black.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Subjects were assigned by coin toss". (Blum 2008, p. 469)
Allocation concealment (selection bias)	Unclear risk	**Comment:** No indication of bias
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "While we intended to conduct blind assessments, we found it nearly impossible to maintain blindness. The convergence of both rater- and patient-administered scales suggests that this may not have been an important deficiency." (Blum 2008, p. 477)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** analysis was conducted on those participants that actually started to receive the allocated intervention, regardless of completion or noncompletion. However, 40 participants that had been randomly allocated did not receive the allocated intervention and were not included in analyses. **Quote:** "Subjects with at least one post-baseline assessment were included in the analyses." (Blum 2008, p. 470)
Selective reporting (reporting bias)	High risk	**Comment: a** study protocol was available, but there was no information about primary or secondary outcomes. The authors reported a broad range of outcomes, so there was no indication for selective reporting given. However, there was insufficient information to permit judgment of 'Yes' or 'No'.
Other bias	High risk	**Adherence bias:** "Adherence to the manual was rated on a 5-point scale [...] A score of 4 (good) or higher was considered acceptable. Two Ph.D.-level psychologists who were not involved with the randomized controlled trial but familiar with STEPPS rated 43 randomly selected video-taped sessions. The mean adherence score was 4.4 (SD = 0.8)." (Blum 2008, p. 470) **Allegiance bias:** some authors are founders of STEPPS, the treatment actually used in the experimental group, therefore an allegiance effect seemed possible. **Attention bias:** more attention was paid to STEPPS group participants.

Bohus 2013

Study characteristics

Methods	Randomised controlled trial with 2 treatment arms 1. Dialectical behavioral therapy 2. Waiting list **Duration of trial:** 3 months of inpatient treatment (i.e. 13 weekly sessions in each condition) + 1 booster session 6 weeks after dismissal **Country:** Germany **Setting:** inpatient

Bohus 2013 *(Continued)*

Participants	**Methods of recruitment of patients:** referred by local psychiatrist **Sample size:** 74 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** International Personality Disorder Examination (IPDE) **Mean age:** 32.9 years (range = 19-52 years) **Sex:** 100% female **Inclusion criteria** 1. Treatment-resistant post-traumatic stress disorder 2. Women **Exclusion criteria** 1. Lifetime diagnosis of schizophrenic disorder 2. Severe other mental disorder(s) requiring immediate treatment in a different setting (e.g. eating disorder or acute delirium after withdrawal) 3. Suicide attempt with clear suicidal intention during last 4 months 4. Severe self-injuring behaviour during last 4 months
Interventions	**Experimental group** **Treatment name:** dialectical behavioral therapy for patients with post-traumatic stress disorder after childhood sexual abuse (DBT-PTSD); depressive episodes were treated with selective serotonin reuptake inhibitor antidepressive agents (100-150 mg/d of sertraline); difficulties of sleeping were treated with sleep-inducing antidepressants (50-100 mg/d of trimipramine); no benzodiazepines, no neuroleptics **Number randomised to group:** 36 **Duration:** 3 months, 13 psychotherapy sessions of 120 minutes each **Control/comparison group** **Comparison name:** Waiting list **Number randomised to group:** 38 **Duration:** 3 months (continuation of already ongoing treatments for 6 months, inpatient DBT-PTSD treatment afterwards; points of measurement: baseline, 3 months, 4.5 months and 6 months after study inclusion) **Both groups** **Concomitant psychotherapy:** participants in the experimental group did not receive any other individual or group psychotherapy; participants in the waiting-list condition continued their usual treatments (if any) **Concomitant pharmacotherapy:** psychiatrists in both treatment arms were free to follow their clinical experience **Proportions of participants taking standing psychotropic medication during trial observation period:** 82.9% of DBT-PTSD group, 87.1% of control group (P = 0.74)
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed with the Borderline Symptom List (BSL)

Bohus 2013 *(Continued)*

	Secondary 1. Dissociation, assessed with the Dissociative Experience Scale (DES) 2. Depression, assessed with the Becks Depression Inventory II (BDI-II)
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** Originally, female participants with a diagnosis of post-traumatic stress disorder (PTSD) and at least 4 criteria of DSM-IV-BPD were eligible. We refer to the subsample data of those participants fulfilling 5 or more criteria.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomisation was carried out using the procedure proposed by Efron". (p. 224) (the bootstrapping method)
Allocation concealment (selection bias)	Low risk	**Quote:** "Care was taken that the randomization was concealed to both the patient and to all persons involved in the study until the written informed consent has been given by the patient." (p. 224)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Interviewers were blinded. [...] the diagnostician who was assessing the patient at follow-up was masked to the assignment." (p. 224)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** No further details provided about attrition rates
Selective reporting (reporting bias)	Low risk	**Comment:** a study protocol was available (NCT00481000), no indication for selective reporting
Other bias	High risk	**Attention bias:** more attention paid to active group

Borschmann 2013

Study characteristics

Methods	6-month trial with 2 arms 1. Joint crisis plan plus treatment-as-usual (JCP) 2. Treatment-as-usual (TAU) **Duration of trial:** 6 months **Duration of participation:** 6 months **Country:** UK **Setting:** outpatient
Participants	**Method of recruitment of participants:** patients under ongoing care of community mental health teams **Sample size:** 88 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR)

Borschmann 2013 *(Continued)*

Means of assessment: Structured Clinical Interview for Personality Disorders (SCID-II)

Mean age: 35.8 years (standard deviation = 11.6)

Sex: 19.3% male

Comorbidity: alcohol use disorders (according to AUDIT test score), depression (according to Hamilton Anxiety and Depression Scale - depression subscale score)

Inclusion criteria

1. Aged 18 years or older
2. Borderline personality disorder according to Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR)
3. Had self-harmed in the previous 12 months (defined as at least one act with a non-fatal outcome in which the individual had initiated a behaviour (such as self-cutting), or ingested a toxic substance or object, with the intention of causing harm to themselves)
4. Under the ongoing care of a community mental health team
5. Able to provide written informed consent

Exclusion criteria

1. Currently inpatient
2. Primary diagnosis of a psychotic illness
3. Unable to read or write in English
4. Unable to provide written informed consent

Interventions	**Experimental group** **Treatment name:** joint crisis plan + treatment-as-usual (JCP) **Number randomised to group:** 46 **Duration:** 6 months **Control/comparison group** **Comparison name:** treatment-as-usual (TAU) **Number randomised to group:** 42 **Duration:** 6 months **Both groups** **Concomitant psychotherapy:** as provided usually by community mental health team **Concomitant pharmacotherapy:** yes, as part of standard care, if needed **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Frequency of self-harm, assessed by a quote: "Self-harm data were obtained from an established self-report questionnaire" (by Hawton 2002) 2. Mental health status (social functioning), assessed by the Work and Social Adjustment Scale (WSAS) **Secondary** 1. Depression, assessed by the depression subscale of the Hamillton Anxiety and Depression Scale(HADS-D) 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes, but with remarks that this was the pilot study **Ethics approval:** approved by the South London Research Ethics Committee (reference number: 09/H0803/113) **Comments from review authors:**

Borschmann 2013 *(Continued)*

1. It seems all outcomes listed in the protocol were reported. However, an additional outcome measure not listed in the protocol has been used as well; the Warwick-Edinburgh Mental Well-Being Scale (WEMBS), and Hamillton Anxiety and Depression Scale data were assessed not only at the time of baseline but also at follow-up.
2. Information about treatment adherence was received by email from Dr Borschmann.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomisation was conducted at the level of the individual and was stratified by alcohol use […] and depression […]. Randomisation was managed electronically by the Clinical Trials Unit at the Kings's College London Institute of Psychiatry, UK." (p. 358)
Allocation concealment (selection bias)	Low risk	**Quote:** "Randomisation was managed electronically by the Clinical Trials Unit at the Kings's College London Institute of Psychiatry, UK." (p 358)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Follow-up data were collected by a research worker who was masked to treatment allocation and all data analyses were conducted by a statistician who was also masked to treatment allocation. The extent to which masking was achieved in the collection of outcome data was assessed at the end of the trial". (p. 358) "…all data analyses were conducted masked to treatment allocation and follow-up data were collected by a researcher masked to treatment allocation and this masking was maintained in 62 of 73 cases (85%)." (p. 362)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "All analyses were based on the Intention-to-treat sample using a statistical analysis plan finalised by the trial statistician (J.M.H.) and approved by the principal investigator (P.M.) in advance of conducting any analyses." (p. 359) Dropout rates were similar across both groups.
Selective reporting (reporting bias)	Low risk	**Comment:** Additional use of outcomes not specified in the protocol (esp. HADS), but no indication of bias
Other bias	High risk	**Treatment adherence:** "Progress of the trial, [and] adherence to protocol […] were overseen by a trial steering committee." (Borschmann 2013, p 358) "Adherence to the protocol was high, as a total of 41 out of 46 participants in the JCP + TAU group (89.1%) attended their JCP planning meeting and consequently received the active intervention. […] Data gathered at follow-up indicated that JCPs were used both during and between crises and were viewed favourably by the majority of participants. More than 90 percent of participants were still in possession of their JCP at follow-up (two participants stated that they had lost their plans) and approximately three-quarters stated that they had used their JCP during a crisis". (Borschmann 2014, p 170) "All JCP meeting were facilitated by the same person (i.e. me), so fidelity between facilitators was not an issue. We did not record any meetings though – adherence was only measured by the same checklist being completed (by me) during each meeting to ensure uniformity between participants." (Borschmann 2013 [pers comm] **Allegiance bias:** Though developers/advocates of JCP were involved (especially Kim Sutherby, George Szmukler), there was no indication of bias, as no significant effects were found. **Attention bias:** Both groups received TAU, but the JCP group received an additional meeting with carers and healthcare professionals to elaborate their joint crisis plan.

Borschmann 2013 *(Continued)*

Vested interest: no indication of bias

Bos 2010

Study characteristics	
Methods	Multicentre, parallel-arm trial with 2 treatment arms 1. Systems Training for Emotional Predictability and Problem Solving 2. Treatment-as-usual **Duration of trial:** 4.5 months **Country:** The Netherlands **Setting:** outpatient
Participants	**Methods of recruitment of participants:** patients recruited from nonacademic outpatient clinics of 2 mental health care institutes in The Netherlands (Lentis, Groningen; Dimence, Deventer) **Sample size:** 79 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II), Personality Disorders Questionnaire (PDQ-IV) **Mean age:** 32.4 years **Sex:** 86.1% female **Comorbidity:** not stated **Inclusion criteria:** none reported **Exclusion criteria** 1. Insufficient command of Dutch language 2. Intellectual disability 3. In coercive treatment 4. Acute endangering self or others
Interventions	**Experimental group** **Treatment name:** systems training for emotional predictability and problem solving (STEPPS) program + limited individual therapy (STEPPS + LIT; STEPPS) **Randomised to group:** 42 **Duration:** 4.5 months (18 weekly sessions) **Control/comparison group** **Comparison name:** treatment-as-usual (TAU) **Randomised to group:** 37 **Duration:** 4.5 months (offered every 1 to 4 weeks) **Both groups**

Bos 2010 *(Continued)*

	Concomitant psychotherapy: STEPPS-related treatments like dialectical behavior therapy (DBT) or family groups or family members of the patients were not allowed; all participants were allowed to have contacts with social worker or another healthcare professional. **Concomitant pharmacotherapy:** All participants were allowed to have (medication) contacts with a psychiatrist. **Proportions of participants taking standing psychotropic medication during trial observation period:** Exact proportions unclear. “We further investigated whether the results were confounded by the use of psychotropic medication. Medication use did not differ between the two conditions. Adding medication use at the different time points (yes/no) to the models did not weaken the results; on the contrary, estimated differences became larger and p values smaller. Thus, the results were not likely confounded by medication use.“ (Bos 2010, p. 178)
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed with the Borderline Personality Disorder checklist-40 total score (BPD-40) 2. Self-harming behaviour, assessed by number of patients scoring above the cut-off on the Borderline Personality Disorder Severity Index-IV (BPDSI-IV) - parasuicide subscale **Secondary** 1. Interpersonal problems, assess with the World Health Organization Quality of Life Assessment-Bref (WHOQOL BREF) - social relationships subscale 2. Impulsivity, assessed by the number of patients scoring above the cut-off on the Borderline Personality Disorder Severity Index-IV (BPDSI-IV)
Notes	**Sample size calculation:** yes **Ethics approval:** The study protocol was approved by the Medical Ethical Committee for Dutch Mental Health Institutes. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** Allocation was determined by drawing of lots (equal numbers for both groups at each study site) some weeks before start of the STEPPS group after inclusion of all participants.
Allocation concealment (selection bias)	Low risk	**Comment:** Randomisation was carried out by a research assistant.
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "Interviews were conducted by research assistants who were not blind to treatment group assignment." (p. 300) **Comment:** Non-blindness of interviewers may have affected interviewer-assessed outcomes, i.e. BPDSI-IV impulsivity and parasuicide scores. All other outcomes were self-rated by participants.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Quote:** "All available data of patients who received the intervention according to protocol were used in the analyses. Intention-to-treat analyses, in which also patients are included who did not receive the intervention as intended, were performed as well. The per protocol and intention-to-treat analyses yielded similar results. We present only the per-protocol analyses, as we are

Bos 2010 *(Continued)*

		primarily interested in “method effectiveness” (as opposed to “use effectiveness"). (p. 300)
Selective reporting (reporting bias)	Unclear risk	**Comment:** No indication for selective reporting, but Insufficient information to permit judgement of 'Yes' or 'No'
Other bias	High risk	**Adherence bias:** "STEPPS therapists met twice a year under the supervision of expert trainers to evaluate the procedure and to preserve uniformity. Individual therapists in the STEPPS condition received a 1-day training and monthly phone supervision. After each session, individual therapists in both conditions completed a self-report questionnaire by which the content and frequency of the therapy contacts could be checked." (p. 300) **Allegiance bias:** "[...] this RCT on STEPPS is the first done by others than its developers." (p. 303) **Attention bias:** more attention was paid to STEPPS participants.

Carmona í Farrés 2019

Study characteristics	
Methods	Randomised controlled with 2 arms 1. Dialectical behavioral therapy - mindfulness 2. Dialectical behavioral therapy - interpersonal effectiveness **Duration of trial:** 10 weeks **Country:** Spain **Setting:** outpatient
Participants	**Method of recruitment of participants:** Patients for this single-centre randomised trial were recruited from the outpatient facility of the Hospital de la Santa Creu i Sant Pau (Barcelona, Spain). **Overall sample size:** 70 **Diagnosis of borderline personality disorder:** Structured clinical interview for DSM IV axis II personality disorders (SCID II) **Means of assessment:** Diagnostic interview for borderline (DIB-R) **Mean age:** 31.9 years **Sex:** 90% female **Comorbidity:** no comorbidity **Inclusion criteria** 1. Borderline personality disorder diagnosis based on 2 semi-structured interviews 2. Aged 18–50 years 3. Not receiving any other type of psychotherapy at the time of study enrollment 4. No previous training in mindfulness, other meditation-contemplative practices (e.g. compassion or loving-kindness practices), or any other mind-body practice 5. No comorbidities with any of the following conditions: schizophrenia, drug-induced psychosis, organic brain syndrome, substance dependence, bipolar disorder, mental retardation, or major depressive episode in course

Carmona í Farrés 2019 *(Continued)*

	Exclusion criteria 1. Comorbidities with any of the following conditions: schizophrenia, drug-induced psychosis, organic brain syndrome, substance dependence, bipolar disorder, mental retardation, or major depressive episode in course
Interventions	**Experimental group** **Treatment name:** dialectical behavioral therapy (DBT) - mindfulness **Number randomised to group:** 35 **Duration:** 10 weeks **Control/comparison group** **Comparison name:** dialectical behavioral therapy (DBT) - interpersonal effectiveness **Number randomised to group:** 35 **Duration:** 10 weeks **Both groups** **Concomitant psychotherapy:** not allowed to receive any other type of psychotherapy **Concomitant pharmacotherapy:** Patients were allowed to continue taking any medications prescribed prior to study inclusion, provided that no modifications of the medication type or dose were made during the intervention period. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Borderline Symptom List-23 (BSL) **Secondary** 1. Impulsivity, assessed by the Barrett Impulsiveness Scale-11 (BIS) 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** no **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "An independent statistician randomized the participants using a computer-generated sequence (blocks of four participants without stratification)." (Carmona í Farrés 2019 [pers comm])
Allocation concealment (selection bias)	Low risk	**Quote:** "An independent statistician randomized the participants using a computer-generated sequence (blocks of four participants without stratification), allocation was concealed". (Carmona í Farrés 2019 [pers comm])
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "the evaluators of the patients were blinded to the participants' treatment arm throughout the study." (Carmona í Farrés 2019 [pers comm])

Carmona í Farrés 2019 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	High risk	**Quote:** "Analyses were conducted on the per-protocol sample, comprising participants who completed at least 80% of the intervention and for whom all data points (pre- and post-intervention) were available." (Carmona í Farrés 2019, p. 5) "Analyses of primary outcomes [i.e., DERS, BIS-11] were also conducted in the intention-to-treat (ITT) sample, including all enrolled participants, regardless of whether they completed the intervention or not. Missing data were treated with the last observation carried forward method (Little and Rubin 1987). Further analyses [i.e., BSL-23] were run only for subjects considered completers." Reported data (means, SDs) which were used for effect size calculation in this review were based on completers. "Of the 70 participants who participated in the study, a total of 18 dropped out: 13 in the DBT-M group (37.14%) and 7 (20%) from the DBT-IE group. There were no differences between completers and non-completers in baseline demographic characteristics." (Carmona í Farrés 2019, p. 6)
Selective reporting (reporting bias)	Low risk	**Comment:** Reported outcomes matched study protocol.
Other bias	Low risk	**Allegiance bias:** No obvious allegiance bias **Adherence bias:** "In relation to treatment adherence, the group sessions were witnessed by video camera, after the session a feedback to the therapists were provided, but there is no available to Spanish any validated DBT adherence tool measurement." (Soler 2019a [pers comm]). Adequate measures taken to ensure treatment adherence. **Attention bias:** Equal amounts of attention spent on both groups. Both the DBT-M and DBT-IE interventions were delivered in a group format consisting of 9–12 participants. The treatment sessions were 2.5 h in length and held once weekly over a 10-week period.

Carter 2010

Study characteristics	
Methods	Parallel-arm, randomised controlled trial with 2 treatment arms 1. Dialectical behavioral therapy (DBT) 2. Treatment as usual + waiting list (TAU + WL) **Duration of trial:** 6 months (all participants were offered 12 months of DBT, but the comparison between groups was restricted to the first 6 months of DBT vs TAU + WL). **Country:** Australia **Setting:** outpatient
Participants	**Methods of recruitment of participants:** Participants were referred from treating general practitioners, treating psychiatrists or public mental health services (any units of Hunter Mental Health Services). **Sample size:** 73 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** clinical interview, ICD-10 International Personality Disorder Examination (IPDE) **Mean age:** 42.5 years (standard deviation = 6.1)

Carter 2010 *(Continued)*

Sex: 100% female

Comorbidity: participants showed substantial psychopathology with high rates of BPD criteria, International Personality Disorder Examination (IPDE) scores and Axis 1 comorbidity.

Inclusion criteria: not stated

Exclusion criteria

1. Schizophrenia
2. Bipolar affective disorder
3. Psychotic depression
4. Florid antisocial behaviour
5. Developmental disability
6. Disabling organic condition; "The psychiatrist assessor had the option of determining if any potential subjects were unsuitable for inclusion in therapy or unmotivated to participate, although there were no specific criteria for this exclusion." (quote, p 164)

Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 38 **Duration:** 6 months (weekly individual therapy, weekly group-based skills training, telephone access to an individual therapist, therapist supervision) **Control/comparison group** **Comparison name:** TAU + waiting list **Number randomised to group:** 35 **Duration:** 6 months (participants were offered DBT treatment after a 6-month waiting period) **Both groups** **Concomitant psychotherapy:** participants were asked to discontinue psychological therapy of any sort for at least the 12-month duration of dialectical behavior therapy (DBT) **Concomitant pharmacotherapy:** not specified **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Self-harm, assessed as the number of patients with self-harming behaviour 2. Mental health status, assessed with Brief Disability Questionnaire - subscale, days out of role **Secondary** 1. Interpersonal problems, assessed with the World Health Organization Quality of Life Instruments (WHOQOL-BREF) - social relationships subscale
Notes	**Sample size calculation:** yes **Ethics approval:** not stated **Comments from review authors:** 1. We received information about the trial from the first author via email.

Carter 2010 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** the authors used a computerised random number generator to generate allocations - placed into sealed opaque envelopes (in blocks of 8). Envelope drawn after baseline assessments complete". (Carter 2010 [pers comm])
Allocation concealment (selection bias)	Low risk	**Quote:** "Randomization was carried out by the research staff. [...] participants were allocated by selecton of sealed opaque envelopes." (p. 164)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Outcomes were determined [...] by assessors blinded to allocation. [...] All reasonable attempts were made to maintain blindness to allocation status for these raters, but this could not achieve perfect blindness." (pp. 164)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors conducted per protocol analyses (DBT group: 20 completers of treatment and self-reports out of 38 allocated to this group; TAU group: 31 completers of waiting list and self-reports out of 35 allocated)
Selective reporting (reporting bias)	Unclear risk	**Comment:** there was no indication for selective reporting, but Insufficient information to permit judgement of 'high' or 'low'.
Other bias	High risk	**Performance bias:** "The intervention condition was based on the comprehensive DBT model, a team-based approach including [...] therapist supervision groups." (p. 163). "[...] possible inferiority of training of DBT therapists to that of those in other studies or inferior adherence to the DBT methods despite adequate training" (p. 170). There was no mention of any objective means of assessment. **Allegiance bias:** no indication of allegiance bias **Attention bias:** more attention paid to DBT group participants

Cottraux 2009

Study characteristics

Methods	Randomised controlled trial with 2 treatment arms 1. Cognitive therapy (CT) 2. Rogerian supportive therapy (RST) **Duration of trial:** 1 year **Country:** France **Setting:** outpatient
Participants	**Methods of recruitment of participants:** borderline personality disorder outpatients recruited and treated at 2 university hospital centres: Lyon (Anxiety Disorder Unit) and Marseille (Behaviour Therapy Unit) **Sample size:** 65 **Diagnosis of borderline personality disorder diagnosis:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)

Cottraux 2009 *(Continued)*

Means of assessment: structured interview screening form, Revised Diagnostic Interview for Borderlines (DIB-R)

Mean age: CT = 34.3 years (standard deviation = 10.2), RST = 32.6 years (standard deviation = 8.3)

Sex: 76.9% female

Comorbidity: "The MINI investigation found a high DSM-IV axis-1 comorbidity throughout the entire sample: 40% of the patients had a social phobia, 26% a panic disorder, 15% agoraphobia, 18% a current PTSD, 15% presented hypomania, 38% bulimia, 23% a somatisation disorder, 26% excessive alcohol consumption, 32% took street drugs irregularly, 53% presented a generalised anxiety disorder, 55% a current major depressive disorder and 46% were at risk of suicide. Frequencies of the diagnoses were comparable in the 2 groups [...].
There was no between-group difference in psychometric assessment for the 62 patients evaluated before therapy (table 2)." (Cottraux 2009, p. 311)

Inclusion criteria

1. Patients meeting the diagnosis of borderline personality disorder

Exclusion criteria

1. Age under 18 or over 60 years
2. Psychotic disorders with current delusions
3. Significant drug or alcohol addiction
4. Antisocial behaviours
5. Living too far from the study centres

Interventions

Experimental group

Treatment name: cognitive therapy

Number randomised to group: 33

Duration: 6 months (1-hour sessions 24 sessions)

Control/comparison group

Comparison name: Rogerian supportive therapy

Number randomised to group: 32

Duration: 6 months (1-hour sessions 24 sessions)

Both groups

Concomitant psychotherapy: eligible patients were not to be following psychotherapy at the time of the study

Concomitant pharmacotherapy: participants could keep their medication as long as they accepted to have it monitored by the principal investigator

Proportions of participants taking standing psychotropic medication during trial observation period: unclear; current psychotropic medication at baseline: CT N = 24 (72.7%), RT N = 26 (81.3%); P = 0.55

Outcomes

Primary

1. Self-harming behaviour, assessed with: "a checklist constructed to rate self-harming behaviours" (quote) - (SHBCL)
2. Mental health status, assessed with the ClinIcal Global Impression - Severity (CGI-S) scale
3. Suicidality, assessed with the Beck Hopelessness Scale (BHS)

Secondary

Cottraux 2009 *(Continued)*

	1. Impulsivity, assessed with the Eysenck Impulsivity Venturesomeness Empathy Questionnaire (IVE-I) 2. Depression, assessed with the Becks depression inventory (BDI)
Notes	**Sample size calculation:** not stated **Ethics approval:** The ethics committee, CCPPRB Lyon B, approved the protocol for the entire country. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "The randomisation process used blocks of 4 patients for each centre, and was organised by the Lyon University Hospital's Biostatistics Department." (p. 309)
Allocation concealment (selection bias)	Low risk	**Quote:** "The allocation was confidential and delivered via phone call [of the Biostastics Department] to the secretary of each centre." (p. 309)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Psychologists who had not taken part in the treatments performed the assessment. They had no information on either the randomisation or the treatment and did not attend the team meetings about the patients." (p. 310) "[...] evaluators may have received inadvertent or indirect information from the patients about the treatment underway. The evaluators' blindness was not tested." (p. 313)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors per protocol analyses: treatment completers only (20/33 people randomised to CT, 18/32 people randomised to RST)
Selective reporting (reporting bias)	Low risk	**Comment:** Study protocol available (NCT00131781). There was no indication of selective reporting.
Other bias	Low risk	**Performance bias:** "At the end of each session, the therapists were to complete a checklist of the techniques they used, which was revised and discussed with the prinicipal investigator [...] weekly supervision session." (p. 309) **Allegiance bias:** there was no indication of an allegiance effect. None of the authors was among the developers of any of the treatments under investigation. **Attention bias:** equal amounts of attention paid to both groups

Davidson 2006

Study characteristics

Methods	Multicentre, parallel-arm RCT, with 2 treatment arms 1. Cognitive behavioral therapy and treatment-as-usual 2. Treatment-as-usual (TAU) **Duration of trial**: 1 year **Country:** UK

Davidson 2006 *(Continued)*

	Setting: outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 106 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DMS-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Personality Disorders (SCID) **Mean age:** 31.9 years (standard deviation = 9.1) **Sex:** 84% female **Comorbidity:** "We did not rule out comorbid problems such as depression or alcohol and drug abuse that are common in Borderline personality disorder." (quote, p 8) **Inclusion criteria** 1. Patients with borderline personality disorder **Exclusion criteria** 1. Patients currently receiving inpatient treatment for a mental state disorder 2. Currently receiving a systematic psychological therapy of specialist service 3. Insufficient knowledge of English 4. Evidence of organic illness 5. Mental impairment 6. Alcohol or drug dependence 7. Schizophrenia or bipolar affective disorder 8. Drug or alcohol abusing patients were eligible for inclusion
Interventions	**Experimental group** **Treatment name:** cognitive behaviour therapy + treatment-as-usual (CBT + TAU) **Number randomised to group:** 54 **Duration:** 1 year (mean = 27 sessions) **Control/comparison group** **Comparison name:** treatment-as-usual (TAU) **Number randomised to group:** 52 **Duration:** 1 year **Both groups** **Concomitant psychotherapy:** patients currently receiving inpatient treatment for a mental state disorder or a systematic psychological therapy or specialist service were excluded. All other kinds of treatments a patient would have received if the trial had not been in place (e.g. general practitioner care, contact with community mental health teams) were allowed. 90% of participants were in contact with mental health services. **Concomitant pharmacotherapy:** allowed as part of TAU which allowed "all other kinds of treatments a patients would have received if the trial had not been in place". **Proportions of participants taking standing psychotropic medication during trial observation period:** There were no details on how many of the study participants actually received psychotropic medical treatment.

Davidson 2006 *(Continued)*

	"Although no information on comorbidity or the use of prescription drugs was collated, there are no major imbalances in resource utilisation to suggest that comorbidity or drug prescribing differed either across the original randomised groups or in the subset of the 76 patients who were followed up." (Davidson 2010, p. 461)
Outcomes	**Primary** 1. Suicidality, assessed by the mean number of patients with suicidal act in the previous 12 months 2. Parasuicidality, assessed by the number of patients with self-harming behaviour in the previous 12-month period **Secondary** 1. Interpersonal problems, assessed with the Inventory of Interpersonal Problems-Short Circumplex (IIP-SC) 2. Depression, assessed with the Becks Depression Inventory II (BDI-II)
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "The randomization schedules were generated by the study center at [...] Glasgow University, and kept securely and confidentially by the trial coordinator at the Study Coordinating Centre." (p. 437)
Allocation concealment (selection bias)	Low risk	**Quote:** "The randomization schedules were [...] kept securely and confidentially by the trial coordinator [...] The trial coordinator informed the referring agent of the result of randomization immediately and in writing, and then contacted the CBT therapist/s in each area with the patients details so that CBT therapy could be initiated." (p. 437) 106 patients enrolled and randomised
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "The research assistants on each site carry out all assessments and are blind to treatment group allocation. In addition, research assistants request that patients do not mention any details of any psychological treatment they may be receiving. [...] The research assistants responsible for the recording of outcomes were unaware of the treatment allocated or received." (p. 439)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "The analyses were according to the intention-to-treat principle." (p. 454)
Selective reporting (reporting bias)	Low risk	**Comment:** study protocol available (ISRCTN86177428). No indication of selective reporting
Other bias	High risk	**Performance bias:** "All therapists received training in the protocol at the beginning of the trial and regular meetings of all therapists were held to ensure consistency of approach across the sites. In addition, all therapists received weekly supervision from CBT experts at each site." (p. 452) **Allegiance bias:** there was no indication of an allegiance effect. However, as one of the authors is the main author of the CT manual according to which the active group was treated, an allegiance effect seems not improbable.

Davidson 2006 *(Continued)*

Attention bias: more attention paid to CT group participants

Davidson 2014

Study characteristics	
Methods	6-session trial with 2 arms 1. Manual-assisted cognitive therapy (MACT) 2. Treatment-as-usual (TAU) **Duration of trial:** 6-session trial, unknown length **Country:** Scotland **Setting:** outpatient
Participants	**Method of recruitment of participants:** referral to hospital liaison psychiatry team **Sample size**: 20 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV axis II disorders **Mean age:** not stated **Sex:** not stated **Comorbidity:** 4 people had simple personality disorder and 16 had diffuse personality disorder (personality disorder in more than one cluster). The most common diagnoses were borderline personality disorder (n = 17) followed by avoidant (n = 13) and paranoid personality disorder (n = 8). **Inclusion criteria** 1. Aged 18-65 years 2. Presence of personality disorder 3. 3 or more on Standardised Assessment of Personality: Abbreviated Scale (SAPAS) 4. With or without substance misuse **Exclusion criteria** 1. If participants did not consent
Interventions	**Experimental group** **Treatment name:** manual-assisted cognitive therapy (MACT) **Number randomised to group:** 14 **Duration:** 6 sessions **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 6 **Duration:** 6 sessions **Both groups** **Concomitant psychotherapy:** seems as if both treatments included inpatient care, if required **Concomitant pharmacotherapy:** not stated **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary**

Davidson 2014 *(Continued)*

1. Self-harm, assessed by the Acts of Deliberate Self-Harm Inventory (Acts DSH)
2. Suicide-related outcomes, assessed by the Beck Scale for Suicidal Ideation (BSS)

Secondary

1. Depression, assessed by the Hospital Anxiety and Depression Scale(HADS)
2. Attrition, in terms of patients lost after randomisation in each group
3. Adverse effects, as measured by spontaneous reporting

Notes	**Sample size calculation:** not stated **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Patients were randomised to MACT or TAU using a random numbers table with an allocation ratio of 2:1 in favour of MACT". (p.109)
Allocation concealment (selection bias)	Unclear risk	**Comment:** We do not know who conducted the randomisation, or if the participants were informed of allocation prior to baseline assessment. Baseline assessment was conducted by a blinded assessor.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "The research assistant, who assessed patients at baseline and outcome, remained masked to treatment allocation throughout the study." (p.109)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** the authors used intention-to-treat analysis – it did not measure outcome data on all participants (due to attrition), but included all randomised participants in the analysis, evidently. No info on imputation method. 3/14 (21.4%) lost in MACT, 2/6 (33%) in TAU – fairly balanced in numbers. Only one reason given for missing outcome data (suicide). We do not know if reasons differed between the groups.
Selective reporting (reporting bias)	Unclear risk	**Comment:** there was no protocol available for this study.
Other bias	High risk	**Adherence bias:** "Therapy was delivered to individuals in the community by two therapists, a doctoral-level clinical psychologist and a psychiatrist, both trained and supervised on a weekly basis in MACT by one of the authors of the manual (K.D.)." (p. 109) **Allegiance bias:** Main author K.D. is the author of the intervention-manual. **Attention bias:** MACT had 6 sessions. There was no mention of how extensive the TAU treatment was, compared to MACT.

Doering 2010

Study characteristics

Methods	Randomised controlled trial with 2 treatment arms 1. Transference-focused psychotherapy (TFP) 2. Community Treatment by experienced community psychotherapist (CTBE)

Doering 2010 *(Continued)*

	Duration of trial: 12 months **Country:** Germany, Austria **Setting:** outpatient
Participants	**Methods of recruitment of participants:** participants recruited at the outpatient units of the Departments of Psychiatry and Psychotherapy, Technical University of Munich, Germany, and the Psychoanalysis and Psychotherapy Department, Medical University Vienna, Austria **Sample size:** 104 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition, (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV (SCID) **Mean age:** 27.3 years **Sex:** 100% female **Comorbidity:** "Comorbidity with all other personality disorders and with Axis I disorders except those mentioned above were allowed [...]." (p. 391) "There were no significant differences between the groups with regard to sociodemographic and clinical variables at baseline." (p. 391) **Incluson criteria:** not stated **Exclusion criteria** 1. Schizophrenia 2. Bipolar I and Ii disorder with a major depressive episode 3. Manic or hypomanic episode during the previous 6 months 4. Substance dependency (including alcohol) during the previous 6 months 5. Participants meeting 3 or more DSM-IV criteria for antisocial personality disorder 6. Organic pathology 7. Mental retardation 8. Insufficient command of the German language
Interventions	**Experimental group** **Treatment name:** transference-focused psychotherapy (TFP) **Number randomised to group:** 52 **Duration:** 12 months (twice-weekly, individual psychotherapy sessions) **Control/comparison group** **Treatment name:** treatment by experienced community psychotherapist (TBE) **Number randomised to group:** 52 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** psychotherapy other than the study treatment was not allowed in the experimental group. **Concomitant pharmacotherapy:** Medication treatment was not standardised, its type and amount were decided on an individual basis by the individuals' psychiatrists in the community in both groups and registered continuously.

Doering 2010 *(Continued)*

	"There were no significant differences between the groups with regard to medication at baseline and during the 1-year treatment period (Fig. 3). The only participant who received amphetamines was in the transference-focused psychotherapy group. There was no significant influence of psychotropic medication on the outcome variables with the exception of a worse BSI global severity index in medicated participants (F = 43.927, d.f.= 1,101, P = 0.04)." (p. 392)
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the mean number of DSM-IV criteria for borderline personality disorder obtained 2. Suicidality, assessed by the mean number of patients with suicidal acts in the previous 12 months 3. Self-harming behaviour, assessed by the number of patients with self-harming behaviour in the previous 12-month period **Secondary** 1. Depression, assessed with the Beck Depression Inventory (BDI)
Notes	**Sample size calculation:** yes **Ethics approval:** The study was approved by the ethics commission of the Medical University Innsbruck, Austria, on 24 March 2004 (ID: UN1950). **Comments from review authors** 1. Information about the randomisation procedure was received by email from Dr Doering.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** the authors used random numbers, matching after inclusion of 35th patient according to severity of self-harming behaviour during the last year and personality organisation (Doering 2010 [pers comm].
Allocation concealment (selection bias)	Low risk	**Quote:** "The results of the first assessments [screening for inclusion criteria] were sent to a researcher outside the two study centers who performed the randomization." (Doering 2010, p. 5) "After randomization patients were referred to a therapist." (Doering 2010, p. 6)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Research assistants who conducted assessments before randomization and after one year of treatment were blinded for the therapy delivered." (Doering 2010, p. 7)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** Last observation carried forward (LOCF)
Selective reporting (reporting bias)	Low risk	**Comment:** Study protocol available (NCT00714311). No indications of selective reporting
Other bias	Unclear risk	**Performence bias:** "Video recordings of all [EG] sessions were performed and used in the group supervision. [...] Every case was supervised at least every four to six weeks. [...] Experienced community psychotherapists [i.e. CG therapists] attended supervisions according to their usual routine." (Doering 2010, p. 10f.) "For the assessment of adherence and competence of the transference-focused psychotherapists a German translation of a specific Rating of Adherence and Competence [...] was used. [...] The rating was performed by the supervisor after every video-guided supervision of a therapy session." (Doering 2010, p. 11)

Doering 2010 *(Continued)*

Allegiance bias: Some of the study authors are experienced TFP therapists, but none was personally involved in treatment development.

Attention bias: Less attention may have been paid to CG patients depending on the CTBE therapists' main orientation; however, every participant was provided the specifically full amount of necessary attention.

Elices 2016

Study characteristics	
Methods	10-week trial with 2 arms 1. Mindfulness training (MT) 2. Interpersonal effectiveness skills training (IE) **Duration of trial:** 10 weeks **Country:** Spain **Setting:** outpatient
Participants	**Method of recruitment of participants:** participants recruited from the outpatient BPD Unit at the Department of Psychiatry from the Hospital de la Santa Creu in Sant Pau **Sample size**: 64 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV axis II personality disorder (SCID-II) and Diagnostic Interview for Borderlines-Revised (DIB-R). Axis I comorbidities were assessed with the Psychiatric Diagnostic Screening Questionnaire (PDSQ) **Mean age:** MT = 31.56 years (standard deviation = 7.25), IE = 31.72 years (standard deviation = 6.82) **Sex:** 86% female **Comorbidity:** All participants in both groups had at least one comorbid Axis I diagnosis, including anxiety disorders, major depressive disorder, and substance abuse. **Inclusion criteria** 1. Fulfillment of BPD diagnostic criteria (SCID-II and DIB-R) 2. Age from 18-45 years **Exclusion criteria** 1. Lifetime diagnosis of drug-induced psychosis, organic brain syndrome, bipolar or psychotic disorder or mental retardation 2. Participation in any sort psychotherapy during the study or had participated in DBT skills groups in the past 3. Having meditation/yoga experience (having attended more than one session/class in the past
Interventions	**Experimental group** **Treatment name:** mindfulness training (MT) **Number randomised to group:** 32 **Duration:** 10 weeks **Control/comparison group**

Elices 2016 *(Continued)*

Comparison name: interpersonal effectiveness skills training (IE)
Number randomised to group: 32
Duration: 10 weeks

Both groups

Concomitant psychotherapy: no
Concomitant pharmacotherapy: patients under pharmacological treatment were included – provided that no modifications of the medication type or dose were made during the 10-week intervention period.

Proportions of participants taking standing psychotropic medication during trial observation period: no statistically significant difference between proportions taking antidepressants (MT: 83.3%, IE: 65.5%, P = 0.12), benzodiazepines (MT: 50.0%, IE: 53.8%; P = 0.77), antipsychotics (MT: 43.3%, IE: 42.3%, P = 0.93)

Outcomes

Primary

1. Borderline Personality Disorder severity, assessed by Borderline Symptom List - 23 (BSL-23)

Secondary

1. Attrition, in terms of patients lost after randomisation in each group

Some secondary outcomes can be found in a secondary analysis (Soler 2016):

1. Impulsivity, assessed by the the Conners' Continuous Performance Test II (CPT II) Impulsivity Index
2. Attrition, in terms of patients lost after randomisation in each group

Notes

Sample size calculation: yes
Ethics approval: yes

Comments from review authors:

1. Only self-reported screening of Axis-I disorders
2. We received this information by email from Dr Soler: "Elices et al. 2016 (paper in Mindfulness) and Soler et al. 2016 (paper in Borderline Personality Disorder and Emotion Dysregulation) are based on the same sample of patients. The Carmona i Farres 2018 (paper in Mindfulness) also compares Mindfulness to Interpersonal Effectiveness study but are based in a totally different sample of patients."

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomized allocation was performed with the online Research Randomizer (www.randomizer.org/form.htm), a program that generates 16 sets of 4 numbers each (ranging from 1 to 2 for M and IE, respectively). To obtain the same sample size in each treatment arm, allocation had to be perfectly balanced every four sets. Each group comprised eight individuals corresponding to four consecutive sets of randomization." (p. 586)
Allocation concealment (selection bias)	High risk	**Quote:** "The research unit coordinator (not blind to treatment condition) was responsible for the randomization process."
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "A trained psychiatrist and two psychologists familiar with screening interviews, who were blind to treatment arms, conducted diagnostic interviews." (p. 586)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Quote:** "(…) analyses were conducted on both per-protocol (PP) and intention-to-treat (ITT) samples. ITT analyses included all enrolled participants (n = 64), regardless of whether they completed the intervention or not. PP analy-

Elices 2016 *(Continued)*

		ses comprise only participants who completed at least 80% of the intervention (completers), and for whom, all data points (pre- and post-intervention) are available (M group: number of participants = 19; IE group: number of participants = 25). Missing data were treated with the last observation carried forward (LOCF) method (Little and Rubin 1987)". (p. 589) "The dropout rate for mindfulness was higher than in the control group (41 vs.19%)" (p. 590) Missing data treated with LOCF, a potentially biased imputation method. There were clear differences in attrition rates between groups which could have affected outcome estimates. The reasons for dropout also varied between groups. The attrition rate was also higher than estimated in the power calculation.
Selective reporting (reporting bias)	Low risk	**Comment:** Matched study protocol
Other bias	Unclear risk	**Attention bias:** "Participants met once a week in groups of eight for ten consecutive weeks, with each session 150 min in duration. Sessions for both intervention modalities (i.e. M and IE) followed the same structure)." **Treatment adherence:** "Other team members followed each therapy session using a closed-circuit television, enabling supervision and feedback." "Another limitation of the present study is the absence of a treatment adherence measure (TAM), in part because no validated TAM is available in Spanish". **Allegiance bias:** Last author (JS) is a DBT therapist (http://www.es-spd.eu/fileadmin/us er_upload/Board/cvs/Soler_CV.p df). The two arms in this trial were heavily based on DBT. Potential allegiance bias here

Farrell 2009

Study characteristics	
Methods	Randomised controlled trial with 2 treatment arms 1. Group schema focused therapy + individual psychotherapy treatment-as-usual 2. Individual psychotherapy treatment-as-usual **Duration of trial:** 8 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 32 **Diagnosis of borderline personality disorder:** Diagnostic Interview for Borderlines-Revised (DIB-R) **Means of assessment:** Diagnostic Interview for Personality Disorders Revised, Borderline Syndrome Index **Mean age:** 35.6 years **Sex:** 100% female **Comorbidity:** not stated

Farrell 2009 *(Continued)*

	Inclusion criteria 1. Female 2. Age between 18 and 65 years old **Exclusion criteria** 1. Axis I diagnosis of a psychotic disorder confirmed by an open clinical interview 2. Below average IQ
Interventions	**Experimental group** **Treatment name:** group schema focused therapy + individual psychotherapy treatment-as-usual (GSFT + PTAU) **Number randomised to group:** 16 (30 sessions) **Duration:** 8 months **Control/comparison group** **Comparison name:** individual psychotherapy treatment-as-usual (PTAU) **Number randomised to group:** 16 **Duration:** 8 months **Both groups** **Concomitant psychotherapy:** all participants were in individual psychotherapy (eclectic, mainly supportive) throughout the study. **Concomitant pharmacotherapy:** psychopharmacological treatment was not controlled for. **Proportions of participants taking standing psychotropic medication during trial observation period:** all participants were stable on at least 1 psychotropic medication at the start of the study, mostly low doses of antipsychotics or selective serotonin reuptake inhibitor, or both.
Outcomes	**Primary** 1. BPD severity, assessed by the Borderline Syndrome Index (BSI) 2. Mental health status, assessed by the Global Assessment of Function Scale (GAF) **Secondary** 1. Affective instability, assessed by the Diagnostic Interview for Borderline Personality Disorders-Revised (DIB-R) - affect subscale 2. Impulsivity, assessed by the DIB-R - impulsive subscale 3. Interpersonal problems, assessed by the DIB-R - interpersonal subscale 4. Dissociation/stress-related paranoia, assessed by the DIB-R - cognitive subscale
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** 1. Information about the randomisation and allocation procedure was received by email from Dr Farrel.

Risk of bias

Bias	Authors' judgement	Support for judgement

Farrell 2009 *(Continued)*

Random sequence generation (selection bias)	Low risk	**Quote:** "Patients were randomly assigned using a random number table". (p. 319)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear details were reported. After screening for eligibility of 40 patients, N = 8 were excluded. Reasons for exclusion were only given for 3 of them (1 declined participation, 2 did not meet inclusion criteria).Thus, N = 16 were allocated to EG, N = 16 to CG.
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "The DIB-R structured interviews were conducted by two Ph.D. Clinical Psychologists not involved in treatment delivery. Efforts were made to keep them blind to treatment group membership, but for 10% of the subjects the blind was broken due to patient report." (, p. 319) "Therapists were given a GAFS [Global Assessment of Function Scale] checklist to use so that the anchors for assigning scores were in front of them when they recorded their ratings. They were chosen as raters since they were removed from the hypotheses of the study, although not blind to their patients' group membership and no inter-rater reliability was possible." (p. 319) **Comment:** overall, observer-rated outcomes were not assessed by blind raters.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors conducted per protocol analyses.
Selective reporting (reporting bias)	Unclear risk	**Comment:** No indication of selective reporting, but Insufficient information to permit judgement of 'high' or 'low'
Other bias	High risk	**Adherence bias:** "Two of the three groups had the two program developers as therapists and the third had one developer and one clinical psychologist [...] Weekly supervision meetings took place during the course of the study and random videotapes of sessions were reviewed for fidelity by the program developers. The manual developed for the study acted as an additional fidelity check." (p. 322) **Allegiance bias:** The two program developers were study therapists and have authored this study. **Attention bias:** more attention paid to SFT-G participants

Feigenbaum 2012

Study characteristics	
Methods	12-month trial with 2 arms 1. Dialectical behavioral therapy (DBT) 2. Treament-as-usual (TAU) **Duration of trial:** 1 year **Country:** UK **Setting:** outpatient
Participants	**Method of recruitment of participants:** from secondary and tertiary care services **Sample size:** 42

Feigenbaum 2012 *(Continued)*

	Diagnosis of borderline personality disorder: Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV axis II disorders (SCID-II) **Mean age:** DBT = 35.4 years (standard deviation = 7.8), treatment-as-usual = 34.6 years (standard deviation = 7.4) **Sex**: 72-75% female **Comorbidity:** mood disorders, substance abuse, anxiety disorders, eating disorders **Inclusion criteria** 1. Confirmed diagnosis of cluster borderline personality disorder 2. Aged 18- 65 **Exclusion criteria** 1. Long-term psychotherapeutic treatment 2. Met DSM-IV criteria for comorbid psychotic disorder or bipolar I disorder 3. Had opiate dependence requiring specialist treatment 4. Had mental impairment or evidence of organic brain disorder
Interventions	**Experimental group** **Treatment name:** dialectical behavioral therapy (DBT) **Number randomised to group:** 26 **Duration:** 1 year **Control/comparison group** **Comparison name:** treatment-as-usual (TAU) **Number randomised to group:** 16 **Duration:** 1 year **Both groups** **Concomitant psychotherapy:** no data **Concomitant pharmacotherapy:** yes, including antidepressants, antipsychotics, and mood stabilisers **Proportions of participants taking standing psychotropic medication during trial observation period:** "Patients were on a range of medications at time of randomization (predominantly anti-depressants, anti-psychotics, and mood stabilizers). Those patients entering DBT were reviewed by a consultant psychiatrist for the appropriateness of medication." (p. 129) Exact proportions of participants in each group unclear
Outcomes	**Primary** 1. Self-harm, in terms of frequency and severity of self-harm attempts, assessed with Deliberate self harm (SASII) 2. Suicide-related outcomes, assessed by the Suicide Attempt SelfInjury Interview (SASII) 3. Psychosocial functioning, assessed by the functionality subscale of Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM) **Secondary** 1. Anger, assessed by the the Spielberger Anger scale (STAXI); dissociation and psychotic-like symptoms, assessed by the Dissociative Experience Scale (DES) 2. Depression, assessed by the Beck Depression Inventory (BDI) 3. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** none

Feigenbaum 2012 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Treatment allocation was made offsite via telephone randomization using a stochastic minimization programme (MINIM) balancing for sector within the regions to avoid differences in terms of differential referral practices, gender, and presence of BPD. Clients were randomized so that two of three entered DBT and one of three TAU in order to build the caseloads for staff, as this was a new service with no existing clients." (p. 124)
Allocation concealment (selection bias)	Low risk	**Quote:"**Treatment allocation was made offsite via telephone randomization…" (p. 124)
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Quote:** "While we attempted blinding of assessments, as is often the case with psychosocial treatment trials, those carrying out the research assessments could mostly identify the treatment group of the patient." (p. 137)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Quote:** "All results were analyzed using an intention-to-treat analysis based on treatment assignment, 15/26 dropped out in DBT and only 1/16 in TAU. Substantial differences. Unclear [for] the discontinued participants whether they completed the treatment or not." (p. 127) "Of the 26 assigned to DBT, one withdrew consent for the data to be used at end of treatment and five refused to enter the treatment during the pre-commitment phase. A further nine patients dropped out of therapy between months 4 and 9 of treatment. (…) Of those assigned to TAU, only one individual dropped out of receiving any form of treatment." "Those who discontinued treatment continued to contribute data and remained in the trial." (p. 127)
Selective reporting (reporting bias)	Unclear risk	**Comment:** No information
Other bias	Unclear risk	**Treartment adherence:** "Adherence to the therapy was not formally measured. However, adherence to the model was monitored by the team through weekly case discussion, verbal reporting of session content, and listening to each other's audio tapes." (p. 125) **Allegiance bias:** First author is Senior international trainer in DBT for British Isles DBT (https://iris.ucl.ac.uk/iris/browse /profile?upi=JFEIG65). **Attention bias:** "Finally, while information was collected on the types of treatments and services utilized in TAU, the number of hours of TAU intervention was not recorded, thus, it is possible that the differences identified may be due to differing intensities of treatment". (p. 138)

Feliu-Soler 2017

Study characteristics

Methods	3-week trial with 2 arms 1. Loving-kindness and compassion meditations (LKM/CM) 2. Mindfulness continuation training (MCT) **Allocation:** 1:1 **Duration of trial:** 3 weeks **Country:** Spain

Feliu-Soler 2017 *(Continued)*

	Setting: outpatient
Participants	**Method of recruitment of participants:** not stated **Sample size:** 62 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision (DSM-IV-TR) **Means of assessment:** Diagnostic Interview for Borderline Personality Disorders-Revised (DIB-R) **Mean age:** LKM/CM = 35.13 years (standard deviation = 8.25), MCT = 32.5 years (standard deviation = 6.17) **Sex:** 93.8% female **Comorbidity:** not stated **Inclusion criteria** 1. Borderline personality disorder according to DMS-IV-TR criteria and the Diagnostic Interview for Borderline Personality Disorders-Revised (DIB-R) **Exclusion criteria** 1. Diagnosis of drug-induced psychosis 2. Organic brain syndrome 3. Bipolar or psychotic disorder 4. Intellectual disability 5. Participation in any other psychotherapy treatment during the study
Interventions	**Experimental group** **Treatment name:** loving-kindness and compassion meditations (LKM/CM) **Number randomised to group:** 16 **Duration:** 3 weeks **Control/comparison group** **Comparison name:** mindfulness continuation training **Number randomised to group:** 16 **Duration:** 3 weeks **Both groups** **Concomitant psychotherapy:** none C**oncomitant pharmacotherapy:** Psychiatric medication was unaltered during the 3-week study period. **Proportions of participants taking standing psychotropic medication during trial observation period:** exact proportion unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed with the Borderline Symptoms List—23 (BSL-23) **Secondary** 1. Affective instability, assessed by the Inadequate Self, Forms of Self-Criticism/Self-Attacking and Self-Reassuring Scale (FSCRS)
Notes	**Sample size calculation:** not stated **Ethics approval:** yes **Comments from review authors:** none
Risk of bias	

Feliu-Soler 2017 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "To assess the added value of LKM/CMin this sample, patients were randomly allocated to either 3 weeks of LKM/CM or mindfulness continuation training (MCT)". (p. 2) **Comment:** The authors provided insufficient information to make a clear judgement of risk of bias.
Allocation concealment (selection bias)	Unclear risk	**Comment:** the method of concealment was not described.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no information of blinding of outcome assessment
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Quote:** "Missing data were treated with the last-observation-carried forward method" (p. 4). **Comment:** no data on attrition; a more conservative imputation method than last-observation-carried- forward could have been used.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol was available to enable a clear judgement of risk of bias.
Other bias	High risk	**Allegiance bias:** "The interventions were co-led by two clinical psychologists (JS and AF) with long-term personal practice in mindfulness meditation and extensive clinical experience with mindfulness-based programmes and DBT." (p. 2) **Comment:** First and last authors carried out the interventions. **Adherence bias:** no information provided **Attention bias:** all participants received 10 weeks of mindfulness training. Both groups received 3 weeks of LKM/CM or 3 weeks of MCT.

Giesen-Bloo 2006

Study characteristics	
Methods	3-year trial with 2 treatment arms 1. Schema-focused therapy 2. Transference-focused psychotherapy **Duration of trial:** 3 years **Country:** The Netherlands **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 88 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)

Giesen-Bloo 2006 *(Continued)*

Means of assessment: Structured Clinical Interview for DSM-IV (SCID) and Borderline Personality Disorder Severity Index - Version IV (BPDSI-IV)

Mean age: 30.6 years

Sex: 93% female

Comorbidity: "Comorbid Axis I and Axis II disorders were allowed" (p. 650). Numbers of comorbid Axis I and Axis II disorders were equally distributed across groups.

Inclusion criteria: not stated

Exclusion criteria

1. Borderline personality disorder not main diagnosis
2. Psychotic disorders (except short, reactive psychotic episodes)
3. Bipolar disorder
4. Dissociative identity disorder
5. Antisocial personality disorder
6. Attention-deficit/hyperactivity disorder
7. Addiction of such severity that clinical detoxification was indicated (after which entering treatment was possible)
8. Psychiatric disorders secondary to medical conditions
9. Mental retardation
10. No Dutch literacy

Interventions	**Experimental group** **Treatment name:** schema-focused therapy (SFT) **Number randomised to group:** 45 **Duration:** 3 years (50-minute sessions, twice a week) **Control/comparison group** **Comparison name:** transference-focused psychotherapy (TFP) **Number randomised to group:** 43 **Duration:** 3 years (50-minute sessions, twice a week) **Both groups** **Concomitant psychotherapy:** no additional psychotherapeutic treatment allowed **Concomitant pharmacotherapy:** prescribing according to good clinical practice, similar to American Psychiatric Association guidelines, by psychiatrists from different orientations **Proportions of participants taking standing psychotropic medication during trial observation period:** Unclear. No difference in psychotropic medication use at baseline: SFT 77.3%, TFP 71.4%; P = 0.87
Outcomes	**Primary** 1. Borderline severity, assessed with Borderline Personality Disorder Severity Index IV (BPDSI-IV)
Notes	**Sample size calculation:** yes **Ethics approval:** The medical ethics committees of the participating centers approved the study. **Comments from review authors:** none

Giesen-Bloo 2006 *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomization to SFT or TFP was stratified across 4 community mental health centers and was performed [...] after the adaptive biased urn procedure". (p. 650)
Allocation concealment (selection bias)	Low risk	**Quote:** "Randomization to SFT or TFP [...] was performed by a study independent person [...] We used this procedure (1) to keep allocation at each site unpredictable until the last patient to avoid unintentionally affecting ongoing screening procedures [...]." (p. 650) 173 patients were screened for eligibility. 85 of them were excluded, reasons are given (40 declined participation, 24 did not meet inclusion criteria, 19 met exclusion criteria, 2 had insufficient availability); 88 randomised, of 45 allocated to SFT, 44 were included in analyses (1 patient excluded owing to unreliable assessments due to increased patient blindness), of 43 allocated to TFP, 42 were included in analyses (1 patient excluded because untraceable after randomisation; never met or spoke to therapist).
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "assessments were made [...] by independent research assistants [...] Study researchers, screeners, research assistant, and SFT/TFP therapists were masked to treatment allocation during the screening procedure and the first assessment". (p. 650) "most research assistants learned their patients' treatment allocation as the study progressed, as patients talked about their treatment and therapists. However, the results of secondary computer-assessed self-report measures [...] concurred with the observer-rated (interview) findings, making it unlikely that results can be attributed to knowledge of treatment allocation." (p. 657)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "An intention-to-treat approach was applied, using either the last observation during the 3-year treatment period or the last-observation-carried-forward method [...]." (p. 651)
Selective reporting (reporting bias)	Unclear risk	**Comment:** No indication of selective reporting, but Insufficient information to permit judgement of 'high' or 'low'
Other bias	Unclear risk	**Adherence bias:** "Weekly local supervision [...], a 1-day central supervision every 4 months, and a 2-day central supervision every 9 months. [...] Treatment integrity was monitored by means of supervision. All the raters were independent of the study and masked to treatment outcome. One psychologist, masked to allocation, listened to 1 randomly selected tape of each patient, then stated the treatment administered [...] Other trained therapists for each orientation assessed the TFP Rating of Adherence and Competence Scale or the SFT Therapy Adherence and Competence Scale for BPD." (p. 650-651). Issues have been raised about treatment integrity of TFP by the study consultant Dr Yeomans (Yeomans 2015). **Allegiance bias:** experts from both therapies supervised therapists. None of the study authors developed any of the respective therapies. **Attention bias:** equal amounts of attention spent to both groups

Gleeson 2012

Study characteristics

Gleeson 2012 *(Continued)*

Methods	16 weekly session trial with 2 arms 1. Helping Young People Early specialist first-episode psychosis treatment (HYPE + SFET) 2. Specialist first-episode psychosis treatment (SFET) **Duration of trial:** 16 weekly sessions **Country:** Australia **Setting:** outpatient and inpatient.
Participants	**Method of recruitment of participants:** participants identified by the research assistant in consultation with the outpatient case manager, using a checklist of the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) for borderline personality disorder criteria **Diagnosis of borderline personality disorder:** DSM-IV **Means of assessment:** Structured Clinical Interview for the DSM-IV Axis I Disorders, Patient Edition (SCID-I/P) and the antisocial and borderline personality disorder modules for Axis II disorders (SCID-II) **Mean age:** 18.4 years (standard deviation = 2.9) **Sex:** 82% female **Comorbidity:** 12 participants had a diagnosis of borderline personality disorder (i.e. greater than or equal to 5 DSM-IV criteria), and 4 cases had sub-syndromal borderline personality disorder (4 DSM-IV criteria) **Inclusion criteria** 1. Participants were required to have 4 or more DSM-IV borderline personality disorder features. **Exclusion criteria** 1. Severe and enduring psychotic symptoms (defined as scores of 4 or more on 1 or more psychotic items of the Brief Psychiatric Rating Scale (BPRS), which had persisted for more than 1 month unless symptoms were assessed by treating clinicians as not interfering with psychosocial functioning) 2. Unable to converse in or read English without an interpreter 3. Intellectual deficits precluding meaningful participation in individual psychotherapy 4. Informed consent previously provided for another psychotherapy trial at study site, or already received a course of cognitive analytic therapy, or both
Interventions	**Experimental group** **Treatment name:** HYPE + SFET **Number randomised to group:** 8 **Duration:** 16 weekly sessions **Control/comparison group** **Comparison name:** SFET **Number randomised to group:** 8 **Duration:** not stated **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** eligible for inclusion in study if had less than 6 months of previous treatment with antipsychotic medication **Proportions of participants taking standing psychotropic medication during trial observation period:** "patients taking medications. There were seven cases in the HYPE + SFET [87.5%] and five cases in the SFET [62.5%]." (Gleeson 2012, p. 26) Mean adherence did not differ sig. between groups (P = 0.983). (Tab. 2)
Outcomes	**Primary** 1. Suicide-related outcomes, assessed by the suicidal subscale of the Overt Aggression Scale - Modified for outpatients (OAS-M)

Gleeson 2012 *(Continued)*

	Secondary 1. Anger, assessed by the labile anger subscale of the Anger Irritability and Assault Questionnaire (AIAQ) 2. Depression, assessed by the anhedonia subscale of the Scale for Assessment of Negative Symptoms 3. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** no **Ethics approval:** no **Comments from review authors:** 1. We contacted Dr Gleeson by email asking for separate data on the participants older than 18 years of age. Dr Gleeson could not provide us with these data as very few participants were older than 18 years of age.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomization was coordinated by the statistician (SC) and was based on a computer-generated number list." (p. 23)
Allocation concealment (selection bias)	High risk	**Quote:** "Outcome ratings were made by the study research assistant (RA) who was independent of the treatment, but not blind to treatment allocation because of limited resources for conducting the pilot study". (p. 23)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Outcome ratings were made by the study research assistant (RA) who was independent of the treatment, but not blind to treatment allocation because of limited resources for conducting the pilot study". (p. 23)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** attrition rates: HYPE + SFET, number of participants = 4/8 and SFET, number of participants = 4/8. No reasons for attrition reported. 50% dropout rate. High risk of bias. No report of imputation method (e.g. ITT, as treated). Potential risk of bias. Summed up: High risk of bias
Selective reporting (reporting bias)	High risk	**Comment:** no report of primary or secondary outcomes in the study (unlike the protocol)
Other bias	Unclear risk	**Treatment adherence:** Fidelity to CAT was managed by weekly group CAT supervision provided by two trained CAT supervisors (AC and LMc). (p. 23) **Allegiance bias:** Nothing found. **Attention bias:** No report of duration of the SFET group.

Gratz 2006

Study characteristics

Methods	14-week trial with 2 arms 1. Emotion regulation group intervention + treatment-as-usual (ERG + TAU) 2. Treatment-as-usual + waiting list (TAU + WL) **Duration of trial:** 14 weeks **Country:** USA

Gratz 2006 *(Continued)*

	Setting: outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 25 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV, Zanarini 1996) **Mean age:** 33.3 years (standard deviation = 9.98) **Sex:** 100% female **Comorbidity:** participants excluded if they had comorbid diagnoses **Inclusion criteria** 1. A history of repeated deliberate self-harm, with at least 1 episode in the past 6 months **Exclusion criteria** 1. Diagnosis of a psychotic disorder 2. Bipolar I disorder 3. Substance dependence 4. Reporting one or more suicide attempts rated as having a high risk of death or greater within the past 6 months according to DIB-R (Zanarini 1989) rating 5. Reporting greater than some chance (i.e. the midpoint of the scale) of attempting suicide within the next year according to DIB-R (Zanarini 1989) rating Participation in a dialectical behavior therapy (DBT) skills group within the past 6 months
Interventions	**Experimental group** **Treatment name:** ERG + TAU. 14 weekly, 1.5 hour sessions. Acceptance-based, behavioural group, combining elements of acceptance and commitment therapy (ACT) and DBT as well as aspects of emotion-focused psychotherapy and traditional behaviour therapy **Number randomised to group:** 12 **Duration:** 14 weeks **Control/comparison group** **Comparison name:** TAU + WL **Number randomised to group:** 10 **Duration:** 14 weeks **Both groups** **Concomitant psychotherapy:** Participants were required to have an individual therapist; average number of individual therapy per week was 1.38 hours. 41% of therapists were clinical psychologists, 27% were psychiatrists, 32% were licensed clinical social workers. **Concomitant pharmacotherapy:** All study participants continued with their current outpatient treatment over the course of the study. **Proportions of participants taking standing psychotropic medication during trial observation period:** Unclear. Mean number of psychiatric medications at baseline: ERGT mean = 3.42, SD = 1.39; TAU mean = 3.90, SD = 2.08 (table 1, p. 28), difference NS

Gratz 2006 *(Continued)*

Outcomes	**Primary** 1. Borderline personality disorder severity, assessed with the Borderline Evaluation of Severity over Time (BEST) 2. Self-harming behaviour, assessed with the Deliberate Self-Harm Inventory (DSHI) - frequency score **Secondary** 1. Affective instability, assessed with the emotion dysregulation subscale of the Difficulties in Emotion Regulation Scale (DERS; Gratz 2004)) 2. Impulsivity, assessed with impulse-control subscale of the (DERS) 3. Depression, assessed with the depression subscale of the Depression, Anxiety and Stress Scale (DASS)
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** 1. Information about the randomisation procedure was received by email from Dr Gratz.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Participants [...] were matched on level of emotion dysregulation and number of lifetime incidents of self-harm and randomly assigned to either the group treatment plus TAU condition or the TAU waitlist condition." (p. 27)
Allocation concealment (selection bias)	Unclear risk	**Comment:** No information
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Research team members were not blind to condition; however, all outcome measures were self-report, and there was limited interaction between participants and assessors." (p. 30) Outcomes are not likely to be influenced by lack of blinding.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** per protocol (EG: N = 16, CG: N = 12). 24 participants were included and randomised, there were 2 dropouts (one from each condition), with no reasons given. Final analyses referred to N = 22 patients, N = 12 in EG, N = 10 in TAU condition.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting, but Insufficient information to permit judgement of 'high' or 'low'
Other bias	High risk	**Performance bias:** Treatment approach was developed by the first author who was also the therapist; no further information. **Allegiance bias:** First author developed the treatment approach. **Attention bias:** more attention paid to ERGT participants

Gratz 2014

Study characteristics

Methods	14-week trial with 2 arms

Gratz 2014 *(Continued)*

1. Emotion regulation group therapy (ERGT) for self-harm + treatment-as-usual (TAU)
2. Treatment-as-usual

Duration of trial: 14 weeks. On average, 29 days from randomisation to initial assessment + 14 weeks of treatment + 9 months of follow-up
Country: USA

Setting: outpatient

Participants	**Method of recruitment of participants:** referral through clinicians and self-referral **Sample size:** N = 61 **Number of participants screened:** 91 **Number of participants included:** ERGT + TAU = 31, TAU = 30. 100% female **Number of participants followed up:** 57 **Number of withdrawals:** (reason) 5 for ERGT + TAU, 3 for TAU. Reasons in ERGT + TAU: too busy/other responsibilities (n = 3) , moved away (number of participants = 1), not interested (n = 1). Reasons in TAU: could not be reached (n = 2) and not interested (n = 1) **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV; Zanarini 1996) **Mean age:** ERGT + TAU: 33.3 years, SD = ± 11), TAU: 33.0 years (± 10.9) IQ: NR **Ethnicity:** ethnic minority ERGT + TAU: 16.1%, TAU: 26.7% **Comorbidity:** mood disorders, substance use disorder, anxiety disorder, PTSD, eating disorder, Cluster A, B, C PD **Inclusion criteria** 1. Threshold or subthreshold diagnosis of borderline personality disorder 2. A history of repeated deliberate self-harm, with at least 1 episode in the past 6 months 3. Having an individual therapist, psychiatrist or case manager 4. Being a woman 5. Aged 18–60 years **Exclusion criteria** 1. Diagnosis of a primary psychotic disorder, bipolar I disorder and current (past month) substance dependence
Interventions	**Experimental group** **Treatment name:** ERGT + TAU **Number randomised to group:** 31 **Duration:** 90 minutes per week over 14 weeks **Concomitant psychotherapy:** yes, ongoing outpatient therapy **Concomitant pharmacotherapy:** 1.9 units of psychiatric medication on average per pretreatment. No information regarding patient **Control/comparison group** **Comparison name:** TAU **Number randomised to group**: 30 **Duration:** average of 15 months of treatment prior to trial. 14 weeks in trial **Concomitant psychotherapy:** TAU consisted of a variety of different psychotherapies

Gratz 2014 *(Continued)*

	Concomitant pharmacotherapy: allowed (no further details) **Proportions of participants taking standing psychotropic medication during trial observation period:** Unclear. Mean number of psychiatric medications at baseline: ERGT + TAU 1.9, SD = 1.7; TAU 2.1, SD = 1.2
Outcomes	**Primary** 1. BPD severity, assessed by the Zanarini Rating Scale for Borderline Personality Disorder 2. Self-harm, assessed by the Self-Harm Inventory 3. Mental health status, assessed by the Sheehan Disability Scale **Secondary** 1. Affective instability, assessed by non acceptance subscale of the Difficulties in Emotion Regulation Scale (DERS) 2. Impulsivity, assessed by the impulse subscale of the DERS 3. Interpersonal problems, assessed by the borderline personality disorder-related composite of the Inventory of Interpersonal Problems 4. Depression, assessed by the Beck Depression Inventory – Second Edition 5. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** not stated **Ethics approval:** yes **Comments from review authors** 1. Study could be underpowered due to low sample size 2. Differences in some demographic variables at baseline

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "…and randomly assigned by the principal investigator (PI) to either the ERGT + TAU (number of participants = 31) or TAU waitlist (number of participants = 30) condition using a stratified randomization procedure." (p 2100)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information provided
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "All assessments were conducted by trained assessors masked to participant condition". (p 2103)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "We adopted a Bayesian approach to growth modeling (Zhang et al. 2007) and fit the models using the Markov chain Monte Carlo routines in Mplus (Muthén & Muthén, 1998–2010) using N(0,1010) priors for the intercepts and paths from Condition to the factors, and G–1 (−1,0) priors for the error variances. This approach implements a multiple imputation strategy to handle missing data (Enders, 2010), enabling an analysis of the intent-to-treat (ITT) sample." (p 2104)
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol was available to enable a clear judgement to be made.
Other bias	High risk	**Treatment adherence:** "The PI reviewed all group sessions for adherence and competence (with 25% rated by an independent trained rater with good reliability; κ = 0.90 for adherence ratings and ICC = 0.86 for competence rat-

Gratz 2014 *(Continued)*

	ings)." (p. 2103). Project therapists were adherent to the protocol, with an average of 8.1 ± 1.1 of the encouraged elements discussed in each group and only one minor non-protocol event recorded."; (p 2104). **Allegiance bias:** First author has developed the treatment in the experimental group. **Attention bias:** Tau participants had received, on average, 15 months of treatment prior to participation, and 54% received < 1 hour a week during treatment, compared to no reports on previous treatment in ERGT group, which received 90 minutes weekly psychotherapy.

Gregory 2008b

Study characteristics	
Methods	12 months trial with 2 arms 1. Dynamic deconstructive psychotherapy (DDP) 2. Treatment-as-usual (TAU) **Duration of trial:** 12 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** clinical setting **Sample size:** 30 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 28.7 years (standard deviation = 7.7) **Sex:** 80% female **Comorbidity:** comorbid diagnosis of active alcohol abuse or dependence (not in full sustained remission) required for inclusion **Incluson criteria** 1. 18 to 45 years 2. Diagnosis of borderline personality disorder 3. Active alcohol dependence or abuse **Exclusion criteria** 1. Schizophrenia 2. Schizoaffective disorder 3. Mental retardation 4. Neurological condition that may produce secondary psychiatric symptoms (e.g. stroke, multiple sclerosis, partial complex seizures, or traumatic brain injury)
Interventions	**Experimental group** **Treatment name:** DDP

Gregory 2008b *(Continued)*

Number randomised to group: 15

Duration: 12 months (post-treatment), weekly individual

Control/comparison group

Comparison name: TAU

Number randomised to group: 15

Duration: 12 months (post-treatment)

Both groups

Concomitant psychotherapy: If not already in treatment, TAU patients were referred to an alcohol rehabilitation centre and given names of clinics and therapists in the community. If they had one, TAU participants were allowed to keep their current psychotherapist. DDP participants were required to end treatment with their present psychotherapist, unless that person served primarily as a case manager or substance use counsellor. 70.0% of participants received individual psychotherapy or alcohol counselling, 30.0% received an additional professional group therapy, 36.7% participated in self-help groups.

Concomitant pharmacotherapy: 63.3% of all participants received separate medication management. The mean number of psychotropic medications was 2.9. Medication management was provided by the DDP therapist for patients in the DDP group according to the American Psychiatric Association guidelines for borderline personality disorder. Medications specifically targeting substance use disorders were not prescribed.

[The] “average number of psychotropic medications used during first 12 months of treatment: control group, mean number N = 2.67, SD 1.45; DDP mean number N = 2.34, SD = 1.61" (Gregory 2010, p. 293).

75% of both groups were taking psychotropic medications during the follow-up period; average number of psychotropic medications used: control group mean number = 1.88 (SD = 1.55), DDP group mean number = 1.63 (SD = 1.30) (Gregory 2010, p. 294).

Number of psychotropic medications at end of treatment: DDP 2.0 (SD 1.56), TAU 2.89 (SD 1.69) (Gregory 2008, Tab. 2, p. 33).

Proportions of participants taking standing psychotropic medication during trial observation period: n (%) receiving separate medication management: DDP 0%, TAU 56% (Gregory 2008, Tab. 2, p. 33)

Outcomes

Primary

1. BPD severity, assessed with the Borderline Evaluation of Severity Over Time (BEST)
2. Self-harming behaviour, assessed by the number of patients with parasuicide in the previous 3-month period

Secondary

1. Dissociation/stress-related paranoia, assessed with the Dissociative Experiences Scale (DES)
2. Depression, assessed with the depression subscale of the The Depression, Anxiety and Stress Scale (DASS)

Notes

Sample size calculation: not stated

Ethics approval: not stated

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement

Gregory 2008b *(Continued)*

Random sequence generation (selection bias)	Low risk	**Quote:** "A minimization method was employed for group assignment [...] ensuring comparability of the two groups on key variables or factors [...] The specific factors that we adjusted for included: age, gender, alcohol abuse versus dependence, current alcohol use, antisocial personality disorder, inpatient utilization, and number of parasuicides." (p. 31-32)
Allocation concealment (selection bias)	Low risk	**Quote:** "participants were assigned by the research coordinator to either the investigation treatment or to treatment-as-usual (TAU) in the community". (p. 31)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:**"An independent, trained research assistant administered the primary and secondary outcome measures [...] blind to treatment group at the time of interviews, but blindedness was only partial, as she was able to correctly guess group assignment 67% of the time (50% correct guesses were expected by chance alone)." (p. 35)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** the authors conducted per protocol analyses (EG: 10/15 allocated; CG: 9/15 allocated).
Selective reporting (reporting bias)	Low risk	**Comment:** a study protocol is available (NCT00145678) and there were no indications of selective reporting
Other bias	High risk	**Performance bias:** "Six therapists provided DDP, including the principal investigator [who is one of the two developers of DDP] (PI; N = 6 study participants) and five psychiatry residents (N = 9 participants) who were in their third year of residency training [...] After achieving competency, adherence to technique and treatment integrity for resident therapists was assured through weekly group supervision [...] and individual supervision of videotaped sessions with the PI [principal investigator, developer of DDP] every other week throughout treatment." (Gregory 2008b, p. 34) **Allegiance bias:** Both developers of the experimental treatment were among the study authors. **Attention bias:** Though participants of the control group did not receive an alternate, obligatory control treatment, but were free to join alternative treatments, they did not receive less professional attention. "[...] DDP participants received fewer overall treatment contact hours than did participants receiving community care." (p. 39). Also cf. Tab. 2, p. 33.

Haeyen 2018

Study characteristics	
Methods	3-month trial with 2 arms 1. Art therapy (AT) 2. Waiting list (WL) **Duration of trial:** 3 months **Country:** The Netherlands **Setting:** specialised outpatient treatment unit for personality disorders
Participants	**Method of recruitment of participants:** participants recruited from a waiting list of patients targeted for PD treatment in a specialised outpatient treatment unit for personality disorders

Haeyen 2018 *(Continued)*

Sample size: subsample data = 26
Diagnosis of borderline personality disorder: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV)
Means of assessment: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II)
Mean age: no data for subsample. Mean age of dropouts from full sample = 40.35 years (standard deviation = 10.03), mean age of completers from full sample = 36.6 years (standard deviation = 10.52)
Sex: no data for subsample. Approximately 70% in the full sample

Comorbidity: no data on comorbidity in subsample data. Full sample data: paranoid personality disorder (AT = 2.6%, WL = 2.8%); narcisstic personality disorder (AT = 2.6%, WL = 0%); borderline personality disorder (AT = 36.8%, WL = 27.8%); obsessive compulsive personality disorder (AT = 10.5%, WL = 8,3%); dependent personality disorder (AT = 13.2%, WL = 8.3%); avoidant personality disorder (AT = 15.8%, WL = 25%); unspecified personality disorder (AT = 18.4%, WL = 27.8%); cluster B (AT = 36.8%, WL = 27.8%); cluster C (AT = 23.7%, WL = 36.1%); cluster not otherwise specified (AT = 18.4%, WL = 27,6%); 1 personality disorder (AT = 71.1%, WL = 75%); 2 or more personality disorders (AT = 23.7%, WL = 22.2%)

Inclusion criteria

1. Adults (18+ years) with a primary diagnosis of at least one Axis II Personality Disorder cluster B and/or C or a personality disorder not otherwise specified (APA 2013),
2. An IQ > 80,
3. An adequate mastery of the Dutch language

Exclusion criteria

1. Acute crisis
2. Psychosis
3. Actual and serious suicidal behavior and/or thought
4. Severe brain pathology

Interventions

Experimental group
Treatment name: art therapy
Number randomised to group: 15
Duration: 3 months

Control/comparison group
Comparison name: waiting list
Number randomised to group: 11
Duration: 3 months

Both groups
Concomitant psychotherapy: not stated
Concomitant pharmacotherapy: not stated

Proportions of participants taking standing psychotropic medication during trial observation period: unclear

Outcomes

Primary

1. Psychosocial functioning, assessed by the Outcome Questionnaire-45 (OQ-45), total score

Secondary

1. Interpersonal problems, assessed by the Outcome Questionnaire-45 - interpersonal subscale (OQ-45-I)
2. Attrition, in terms of patients lost after randomisation in each group

Notes

Sample size calculation: yes
Ethics approval: yes. Patients who agreed to participate signed the informed consent form approved by the Medical Ethics Committee of Radboud University.

Comments from review authors:

Haeyen 2018 *(Continued)*

1. We contacted Dr Haeyen in June 2018 asking for more data on some of the outcome scales (number of patients and means and SD). We received subsample data on 18 August 2018.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** patients who agreed to participate signed the informed consent form approved by the Medical Ethics Committee of Radboud University and were assigned randomly to either the experimental or the control group, using dice (p 3). Randomisation by simple randomisation (dice). Full sample would be low risk of bias. However, due to the usage of subsample data, we do not know whether the participants are equally distributed between arms.
Allocation concealment (selection bias)	Unclear risk	**Comment:** it was unclear from the reporting who administered the randomisation and how allocation was handled.
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Comment:** the outcome assessors were not blind to the intervention.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** dropout must be analysed to make sure that the results of the GLM repeated measures are not an artifact of a special type of patient quitting the intervention. There were 17 (23%) patients who quit and 57 (77%) who completed the intervention. No imputation method used for the 17 who dropped out. Full sample should be high risk of bias. We compared future dropouts with completers using observations from the pre-test. Dropouts did not significantly differ from completers on age, dropouts M = 40.35, SD = 10.03; completers M = 36.6, SD = 10.52, t(72) = 1.31; gender, dropouts 58.8% women, completers 73.7% women, X2(1, n = 74) = 1.38; number of PD diagnoses, dropouts 76.5% 1 PD, 17.6% 2 PDs, completers 71.9% 1 PD, 24.6% 2 PDs, X2(2, n =74) = 0.49; the distribution of cluster B/C personality disorders, dropouts 41.2% B, 23.5% C, 17.6% NOS, completers 29.8% B 31.6% C, 24.6% NOS, X2(5, n = 74) = 2.92, P > 0.05; and the OQ-45 Total score, dropouts M = 84.41, SD = 16.73, completers M = 86.33, SD = 22.46, t(72) = 0.33. These results indicate that dropouts can be considered random and thus will not bias the conclusions. (p 6-7)
Selective reporting (reporting bias)	High risk	**Comment:** There was no mention of one outcome that would possibly have been of interest (Dutch Mental Health Continuum-Short Form (MHC-SF)) in the full report stated as outcomes in trial registry. The authors also failed to follow the primary and secondary outcome distinctions from the protocol in the full report.
Other bias	High risk	**Adherence to treatment:** There was no mention of adherence check-up. **Attention bias:** The intervention was compared to a waiting list control. **Allegiance bias:** The first author, SH, is the author of an Art Therapy book on which the protocol was based.

Harned 2014

Study characteristics

Methods	1-year trial with 2 arms 1. Dialectical behavior therapy (DBT) + Dialectical behavior therapy Prolonged-Exposure (DBT-PE)

Harned 2014 *(Continued)*

	2. Dialectical behavior therapy (DBT) **Duration of trial:** 1-year intervention **Country:** USA **Setting:** outpatient clinic
Participants	**Method of recruitment of participants:** individuals seeking treatment at the clinic, flyers and outreach to area treatment providers **Sample size:** 26 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** International Personality Disorder Examination (IPDE, Loranger 1988) **Mean age:** 32.6 years (range = 19-55) **Sex:** 100% female **Comorbidity:** patients had PTSD, any mood disorder, any anxiety disorder other than PTSD, any eating disorder, any substance use disorder **Inclusion criteria** 1. Meets criteria for borderline personality disorder + post-traumatic stress disorder (PTSD) 2. Female 3. Age 18-60 4. Remember at least some part of the index trauma 5. Recent and recurrent self-injury 6. Lives within commuting (transport) distance from clinic **Exclusion criteria** 1. Psychosis, bipolar, mental retardation 2. Legally mandated to treatment 3. Required primary treatment for another debilitating condition
Interventions	**Experimental group** **Treatment name:** dialectical behavior therapy (DBT) + dialectical behavior therapy prolonged-exposure (DBT-PE) **Number randomised to group:** 17 **Duration:** 1 year **Control/comparison group** **Comparison name:** dialectical behavior therapy (DBT) **Number randomised to group:** 9 **Duration:** 1 year **Both groups** **Concomitant psychotherapy:** no **Concomitant pharmacotherapy:** yes, allowed. A "…minimization randomisation procedure […] was used to match participants on […] current use of SSRI medication." (p. 10 et seq.) "The standard DBT pharmacotherapy protocol, which makes tapering off psychotropic medications a treatment goal (but not a requirement), was used for all medications except SSRIs. Given that SSRIs are an empirically supported treatment for PTSD, patients on SSRIs were asked to either taper off the medication before starting the DBT-PE protocol or remain at a constant dose during the DBT-PE protocol portion of the treatment. Psychotropic medications were prescribed by community (non-study) providers." (p 10) No difference in psychotropic medication use at baseline among groups (DBT: 87.5%, DBT + DBT-PE: 88.2%

Harned 2014 *(Continued)*

	Proportions of participants taking standing psychotropic medication during trial observation period: unclear
Outcomes	**Primary** 1. Self-harm, assessed by non-suicidal, self-injury scale 2. Suicide-related outcomes, assessed by the suicide attempt self-injury review 3. Mental health status, assessed by the Global Severity index (GSI) **Secondary** 1. Dissociation and psychotic-like symptoms, assessed by the Dissociative Experiences Scale Taxonomy(DES) 2. Depression, assessed by Hamilton Depression Rating Scale for depression (HRDS) 3. Attrition
Notes	**Sample size calculation:** no **Ethics approval:** yes. **Comments from review authors:** 1. Information about whether or not the outcome assessors were blinded was received by email from Dr Harnad.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** a minimization randomization procedure was used to match participants on five primary prognostic variables: (1) number of suicide attempts in the last year, (2) number of NSSI episodes in the last year, (3) PTSD severity, (4) dissociation and (5) current use of SSRI medication
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information was provided on allocation concealment.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** all assignments were conducted by independent clinical assessors who were blind to treatment conditions.
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** analyses were based on ITT and there seemed not to be any systematic reason influencing dropout rates which were overall similar in both treatment arms.
Selective reporting (reporting bias)	Low risk	**Comment:** matched study protocol NTR3925
Other bias	High risk	**Treatment adherence:** the DBT adherence measure was used to code a random selection of 10% of all DBT sessions for adherence. Results indicated that on average therapists in both conditions delivered adherent DBT (M´s = 4.1, SD = 0.2, ICC = 0.99) and adherence ratings did not differ by condition (t(93) = 0.3, P = 0.80)… DBT PE sessions were also delivered with 'Excellent' adherence to the protocol. **Allegiance bias:** Linehan developed DBT and is the last author. **Attention bias:** DBT-PE received more attention than DBT alone.

Jahangard 2012

Study characteristics	
Methods	4-week trial with 2 arms 1. Emotional intelligence training (EIT) 2. Treatment-as-usual (control group) **Duration of trial:** 4 weeks **Country:** Iran **Setting:** inpatient
Participants	**Method of recruitment of participants:** inpatients at the Farshchian Psychiatric Center of Hamadan were approached. **Sample size**: 30 **Diagnosis of borderline personality disorder:** evaluated with Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Millon Clinical Multiaxial Inventory, 3rd edition (MCMI-III) and a score on the subscale "Personality Disorders" of the MCMI-III of at least 84. Base rate (cut-off score) on the Hamilton Depression Rating Scale **Mean age:** 24.63 years (range = 18-35) **Sex:** 53% female **Comorbidity:** generalised anxiety disorder (GAD), post-traumatic stress disorder (PTSD), current substance dependence, and other affective disorders **Inclusion criteria** 1. Diagnosed with borderline personality disorder with depression by psychiatrists according to DSM-IV criteria 2. Except major depressive disorder, lack of other axis I psychiatric disorders based on the clinical psychiatric interview such as Generalised Anxiety Disorder (GAD), Post-traumatic Stress Disorder (PTSD), current substance dependence, and other affective disorders such as bipolar I and II disorders of dysthymia 3. Borderline personality disorder via Millon Clinical Multiaxial Inventory, 3rd Edition (MCMI-III) and score on the subscale 'personality disorders' of the Millon Clinical Multiaxial Inventory, 3rd Edition (MCMI-III) of at least 84 (cut-off score) 4. Aged 18-35 5. No history of previous hospitalisations or treatments 6. Educational level to third grade **Exclusion criteria** 1. Refusal to participate in emotional intelligence components training or discharge from hospital with personal satisfaction before starting the emotional intelligence training prevention
Interventions	**Experimental group** **Treatment name:** emotional intelligence training **Number randomised to group:** 15 **Duration:** 4 weeks, at least 3 sessions (45-minute/session) per week **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** at baseline, all had antidepressants (SSRI), and 8/15 had benzodiazepines **Control/comparison group** **Comparison name:** control group **Number randomised to group:** 15 **Duration:** 4 weeks

Jahangard 2012 *(Continued)*

	Concomitant psychotherapy: no psychoeducation, and no instructions in improving emotional intelligence or other interventions, which might be considered as a supportive psychotherapy **Concomitant pharmacotherapy:** "All patients were pharmacologically treated with SSRIs for depressive disorders, and, if necessary, with benzodiazepines in case of acute sleep difficulties." (p. 199) At baseline, all had the antidepressants, selective serotonin reuptake Inhibitors (SSRIs). **Proportions of participants taking standing psychotropic medication during trial observation period:** all took SSRIs, benzodiazepines were taken by 87.5% of the EIT group and 66.7% of the control group (P = 0.44)
Outcomes	**Secondary** 1. Depression, assessed by the Hamilton Depression Rating Scale 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** no **Ethics approval:** yes **Comments from review authors:** 1. Information about the randomisation procedure, allocation concealment, missing data and whether or not the outcome assessors were blinded was received by email from Dr Brand.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "We used a simple sample random software: http://www.secutrial.com/blog/2012/05/21/randomisierungen-in- secutrialr/". (Jahangard 2012) [pers comm]
Allocation concealment (selection bias)	Low risk	**Quote:** "patients got codes known only to the study supervisor not otherwise involved in the assessment or intervention". (Jahangard 2012) [pers comm]
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Raters of the outcome variables were unaware of patients' group allocations".(Jahangard 2012) [pers comm]
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "All patients sticked on the study conditions, accordingly, we had no missings".(Jahangard 2012) [pers comm]
Selective reporting (reporting bias)	Unclear risk	**Comment:** Outcomes were identical in protocol and publication. However, in the protocol primary and secondary outcomes were stated and not in the publication.
Other bias	Unclear risk	**Treatment adherence:** no information on treatment adherence was provided. **Allegiance bias:** no indication of bias **Attention bias:** no indication of bias **Vested interest:** no indication of bias

Jochems 2015

Study characteristics

Jochems 2015 *(Continued)*

Methods	12-month trial with 2 arms 1. Motivation feedback 2. Standard treatment or treatment-as-usual (TAU) **Duration of trial:** 12 months **Country:** The Netherlands **Setting:** Outpatient
Participants	**Method of recruitment of participants:** "Subsequently, clinicians were asked to provide their caseload to the PI, who randomly selected ten eligible patients for participation (or if fewer than ten eligible patients were available, all the eligible patients were selected). Clinicians explained to the selected patients the contents and procedure of the study and asked for participation. To enhance the likelihood of participation, patients were given an incentive of €15 for participating." (quote, p 3053) **Sample size:** subsample = 42 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** "As diagnosed by the psychiatrist of the team using the Diagnostic and Statistical Manual of Mental Disorders-Text Revision [fourth edition] criteria and obtained from the medical record" (quote, p 3050-51) **Mean age:** no data on subsample. Full sample: motivation feedback = 45.47 years (standard deviation = 10,4), TAU = 42.5 years (standard deviation = 10) **Sex:** not stated **Comorbidity:** no data on subsample; "Our sample largely represents a broad population of outpatients with diagnoses of psychotic and personality disorders with a variety of comorbid psychiatric disorders". (quote, p 3061) **Inclusion criteria** 1. As diagnosed by the psychiatrist of the team using DSM-IV-TR (text revision) criteria and obtained from medical records 2. Aged between 18 and 65 years 3. Received individual outpatient treatment for their mental disorder **Exclusion criteria** 1. Insufficient command of the Dutch language (which was estimated by the clinician who was most frequently involved with the patient) 2. A documented diagnosis of dementia or chronic toxic encephalopathy
Interventions	**Experimental group** **Treatment name:** motivation feedback **Number randomised to group:** subsample = 16 **Duration:** 12 months **Control/comparison group** **Comparison name:** treatment-as-usual **Number randomised to group:** subsample = 26 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** outpatient care **Concomitant pharmacotherapy:** no data on subsample **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Mental health status, assessed by the Dutch version of the Health of the Nations Outcome Scales (HoNOS)

Jochems 2015 *(Continued)*

Notes	**Sample size calculation:** yes **Ethics approval:** "This study was approved by the Medical Ethical Committee for Mental Health Care Institutions (MotivaTe-IT; trial number NTR2968, Netherlands Trial Register, http://www.trialregister.nl/trialreg/admin/rctview.asp?TC=2968) as well as by the scientific committees of the Western North Brabant Mental Health Center and Breburg Mental Health Center, the specialty mental health institutions where the data were collected." (quote, p 3050) **Comments from review authors:** 1. To enhance the likelihood of participation, patients were given an incentive of €15 for participating (p 3053). 2. We received subsample data on the patient with a BPD diagnosis by email from Dr Jochems on 2 July 2018.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "a computer-generated list of random numbers was used to randomly assign each team to a treatment condition, such that all clinicians and patients in the same team were randomized to a similar treatment". (p. 3053). "The randomization sequence was created using software from www.randomization.org with a 1:1 allocation ratio using random block sizes of 1, 2, and 3". (p. 3053)
Allocation concealment (selection bias)	Low risk	**Quote:** "the random allocation sequence was performed by authors ECJ and HJD prior to approaching treatment teams, such that treatment teams and their members were still unknown and were numbered blindly before entering team numbers into the computer program". (p. 3053)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "At baseline, patients were unaware (blind) as to which treatment condition they had been randomized to. Clinicians had to be made aware of treatment condition as those randomized to MF needed to receive the necessary training prior to baseline assessments such that MF could start immediately thereafter. This blinding procedure is common in psychiatric intervention research. At the 12-month assessment, clinicians and patients were not blind to treatment condition while filling in questionnaires, whereas independent research assistants who looked up information from the medical record and performed interviews with patients were blind to treatment allocation." (p.3053)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** skewed dropout population of non-ethnic Dutch participants in full sample. Only observer data used. Unclear handling of data on subsample data
Selective reporting (reporting bias)	Low risk	**Comment:** a protocol was available and the details matched those presented in the report.
Other bias	Unclear risk	**Adherence bias:** Adherence to treatment: Patients and clinicians in the MF intervention group were asked to fill in a Short Motivation Feedback List (SMFL) every month up to 12 months after baseline assessment. (p. 3051). Clinicians were free to decide for themselves how they would structure this conversation with the patient, such as discussing only one item or several, or discussing differences between patient's and clinician's vision, and they were free to decide how long this would take. The duration and frequency of SMFL assessments were monitored by the research team. (p. 3051) During the course of the study, clinicians were regularly contacted by the PI to monitor the MF intervention and to discuss progress and experiences together with other colleagues who also participated in the MF intervention. These evaluation sessions took place four times over the course of the study. (p.3051) We did not seek for uniformity in TAU as such diversity reflects reality. (p.3051); although we performed eval-

Jochems 2015 *(Continued)*

	uation sessions with clinicians about MF alongside the trial, we have limited insight into what happened during MF sessions as these were neither recorded nor supervised. (p 3061). **Attention bias:** There was no control on the amount of treatment received in the TAU group, but that was intended from the authors to test the real life setting of psychotherapy. **Allegiance bias:** no evidence of allegiance bias found

Jørgensen 2013

Study characteristics	
Methods	18-24 month trial with 2 arms 1. Combined mentalisation based therapy (MBT) 2. Supportive group treatment **Duration of trial:** 18-24 months **Country:** Denmark **Setting:** outpatient
Participants	**Method of recruitment of participants:** referred from outpatient clinics, community psychiatric wards, and psychiatrists in private practice **Sample size:** 111 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-III) **Mean age:** MBT = 29.2 years (standard deviation = 6.1), supportive group = 29 years (standard deviation = 6.4) **Sex:** 95-96% female **Comorbidity:** In the group of patients allocated to mentalisation based therapy (MBT) treatment, 53 (72%) met diagnostic criteria for depression (9 in remission at the time of assessment), 27 (37%) met criteria for anxiety disorder, 14 (19%) met criteria for an obsessive–compulsive disorder and 36 (49%) for a (previous or current) eating disorder. On Axis II, 48 (65%) met criteria for at least 1 personality disorder other than borderline and 16 (22%) for avoidant personality disorder. In the supportive therapy group, 28 (76%) met criteria for depression (11 of these were in remission at assessment), 9 (24%) met criteria for anxiety disorder, 5 (14%) for an obsessive–compulsive disorder and 14 (38%) for a (past or current) eating disorder. 32 (86%) met criteria for at least 1 other personality disorder, 10 (27%) for avoidant personality disorder **Inclusion criteria** 1. DSM-IV BPD 2. age 21 years or over 3. GAF score above 34 **Exclusion criteria** 1. Diagnosis of antisocial or paranoid personality disorder at time of assessment 2. Severe substance abuse 3. Younger than 21 years
Interventions	**Experimental group** **Treatment name:** combined mentalisation-based therapy (MBT) **Number randomised to group:** 74 **Duration:** 18-24 months

Jørgensen 2013 *(Continued)*

Control/comparison group
Comparison name: supportive group treatment
Number randomised to group: 37
Duration: 18-20 months

Both groups
Concomitant psychotherapy: yes, psychoeducational programme once a month for 6 months
Concomitant pharmacotherapy: all participants were offered medical treatment in accordance with American Psychological Association recommendations

Proportions of participants taking standing psychotropic medication during trial observation period: "…34% of patients in combined treatment and 48% of patients in supportive therapy had their medication significantly reduced or withdrawn while in treatment (difference NS, P = 0.24). Only 16% in combined and 7% in supportive therapy had their medical treatment intensified during the course of treatment (difference NS, P = 0.49)." (p. 312)

Outcomes

Primary

1. BPD severity, assessed by the Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II)
2. Psychosocial functioning, assessed by the Global Assessment of Functioning Scale (GAF)

Secondary

1. Interpersonal problems, assessed by the Inventory of Interpersonal Problems (IIP)
2. Depression, assessed by the Beck Depression Inventory (BDI)
3. Attrition

Notes

Sample size calculation: yes
Ethics approval: yes

Comments from review authors:

1. All clinically and statistically significant changes with regard to all symptoms were sustained at follow-up in all outcome measures – no positive or negative changes at follow-up were observed.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "Two-thirds (n = 74) of the 111 patients included in the study were randomized to combined treatment, while one-third (n = 37) were offered supportive group therapy". "The skewed randomization of patients (…), which was dictated partly by a desire on the part of the clinic's management to offer intensive treatment to as many borderline patients as possible, and partly by available treatment resources, reduced statistical power". (p. 307)
Allocation concealment (selection bias)	Unclear risk	**Quote:** "Randomization was conducted by individuals outside the clinic." "Group allocation was not concealed". (Jørgensen 2013) [pers comm]
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "(…)GAF score was then assessed by team consensus. The team was not blind to treatment group when making these ratings as most patients were known by the team." (p. 309)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Quote:** "Statistical power was further reduced by the relatively high attrition rate (…) owing to some patients' refusal to complete all assessments at the assigned time points." "Attrition from the study is relatively high (approximately 43% of included patients with intention to treat, 26% of patients starting treatment)". "The level of attrition from the two groups was not significantly different (Fisher's exact test, P = .79)." (p. 315)

Jørgensen 2013 *(Continued)*

Selective reporting (reporting bias)	Unclear risk	**Comment:** there was no study protocol available to compare with the report.
Other bias	High risk	**Adherence bias:** "the two compared treatments were not based on detailed treatment manuals and our design did not include ongoing systematic monitoring of the two treatment modalities (adherence and competence ratings)". (p 315) **Attention bias:** The combined treatment consisted of 45-min sessions of individual psychotherapy carried out weekly over an 18-month period and 1½-h weekly sessions of group psychotherapy over 18–20 months (starting approximately 3 months after the individual therapy). Supportive treatment consisted of one and a half hours of supportive group therapy every fortnight. **Allegiance bias:** no allegiance found

Kamalabadi 2012

Study characteristics	
Methods	14-week trial with 2 arms 1. Dialectical behavior therapy couple (DBT-C) 2. Control group (waiting list) **Duration of trial:** 14-week intervention **Country:** Iran **Setting:** outpatient
Participants	**Method of recruitment of participants:** referred by psychiatrists of Hafez, Ebne Sina and Razy hospitals in Shiraz **Sample size:** 30 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Borderline Personality Severity Index - Fourth Version (BPDSI-IV) **Mean age**: not stated **Sex:** 100% male **Comorbidity:** not stated **Inclusion criteria** 1. Married males with borderline personality disorder 2. Aged 18-50 years old **Exclusion criteria** 1. Lifetime diagnosis of schizophrenia 2. Bipolar disorder 3. Dissociative identity disorder 4. Antisocial personality disorder 5. Drug addiction 6. Mental retardation
Interventions	**Experimental group**

Kamalabadi 2012 *(Continued)*

Treatment name: DBT-C
Number randomised to group: 15
Duration: 14 weekly sessions

Control/comparison group
Comparison name: waiting list
Number randomised to group: 15
Duration: 14 weekly sessions

Both groups
Concomitant psychotherapy: not stated
Concomitant pharmacotherapy: not stated

Proportions of participants taking standing psychotropic medication during trial observation period: unclear

Outcomes

Primary

1. BPD severity, assessed by the BPDSI-IV, total score
2. Suicide-related outcome, assessed by BPDSI-IV, parasuicidal subscale
3. Psychosocial functioning, assessed by the General Health Questionnaire (GHQ), functioning subscale

Secondary

1. Anger, assessed by the BPDSI-IV, anger subscale
2. Affective instability, assessed by the BPDSI-IV, affect subscale
3. Chronic feelings of emptiness, assessed by the BPDSI-IV, emptiness subscale
4. Impulsivity, assessed by the BPDSI- IV, impulsivity subscale
5. Interpersonal problems, assessed by the BPDSI-IV, interpersonal subscale
6. Abandonment, assessed by the BPDSI-IV, abandonment subscale
7. Identity disturbance, assessed by the BPDSI-IV, identity subscale
8. Dissociation and psychotic-like symptoms, assessed by the BPDSI-IV, dissociation subscale
9. Depression, assessed by the GHQ, depression subscale

Notes

Sample size calculation: not stated
Ethics approval: not stated

Comments from review authors:

1. Unclear whether this was, in fact, an RCT
2. A lot of missing information
3. Underpowered sample

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** no information on random sequence generation
Allocation concealment (selection bias)	Unclear risk	**Comment:** no information provided on allocation concealment
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no clear information provided about blinding of outcome assessors

Kamalabadi 2012 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no information of how many were included and number of dropouts. ANOVA was applied but data analysis was not specified and attrition not reported.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol found, therefore we could not assess the risk of bias due to selective reporting.
Other bias	High risk	**Treatment adherence:** no clear information provided **Allegiance bias:** no indication of bias **Attention bias:** more attention paid to the treatment group since control group was waiting list with no intervention **Vested interest:** no indication of bias due to vested interests

Koons 2001a

Study characteristics	
Methods	6-months trial with 2 arms 1. Dialectical behavior therapy (DBT) 2. Treatment-as-usual (TAU) **Duration of trial**: 6 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 28 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, Revised (DSM-III-R) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 35.0 years **Sex:** 100% female **Comorbidity:** excluded patients with several different comorbid diagnoses (see below) **Inclusion criteria:** 1. women veterans meeting DSM-III-R criteria for BPD **Exclusion criteria** 1. Schizophrenia 2. Bipolar disorder 3. Substance dependence 4. Antisocial personality disorder
Interventions	**Experimental group** **Treatment name:** DBT

Koons 2001a *(Continued)*

Number randomised to group: 14

Duration: 6 months (weekly individual therapy)

Control/comparison group

Comparison name: TAU

Number randomised to group: 14

Duration: 6 months (weekly individual therapy)

Both groups

Concomitant psychotherapy: all participants received individual psychotherapy (TAU: 4 of the therapists described themselves as cognitive-behavioural in primary orientation, 2 as psychodynamic, and 2 as eclectic). Group psychotherapy was part of DBT treatment while TAU patients were offered several group therapies at the hospital (4 out of 10 actually attended group therapy).

Concomitant pharmacotherapy: all participants were offered pharmacotherapy.

Proportions of participants taking standing psychotropic medication during trial observation period: "…all participants, except one in the DBT condition, received pharmacotherapy. In every case, this included an SSRI, and, for some participants, also included a mood stabiliser and/or low-dose neuroleptic." (p. 376) "Participants, except for 1 in the DBT condition, received pharmacotherapy, including selective serotonin reuptake inhibitors (SSRIs) in each case and/or an additional mood stabiliser or low-dose neuroleptic in "some" cases". (quote, p 376) Pharmacotherapy and psychotherapy were provided by separate clinicians in all but 1 TAU case.

Outcomes

Primary

1. Borderline personality disorder severity, assessed by DSM-III-R diagnostic criteria for borderline personality disorder
2. Self-harming behaviour, assessed by mean number of parasuicides in a 3-month period
3. Suicidality, assessed by Beck Scale for Suicide Ideation (BSS)

Secondary

1. Anger, assessed by State-Trait Anger Expression Inventory (STAXI)
2. Dissociation, assessed by Dissociative Experiences Scale (DES)
3. Depression, assessed by Beck Depression Inventory (BDI)

Notes

Sample size calculation: not stated

Ethics approval: not stated

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "28 women were randomized to treatment." (p 374). No further information given
Allocation concealment (selection bias)	Unclear risk	**Comment:** no further details. 28 participants were randomised. 8 were not included in analyses due to not completing treatment (reasons: 2 did not attend the first appointment; 1 dropped out after the first appointment after realising payment was for assessments only, not attending treatment; 2 in TAU and 3 in DBT dropped out after more than one appointment in the first half of treatment citing distance from the medical centre as reason). Analyses referred to N = 10 patients in the DBT and N = 10 patients in the TAU group.

Koons 2001a *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Assesment interviews were conducted by two psychology interns who [...] were unaware of subjects' treatment condition." (p 376)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** analyses per protocol (EG: N = 10; CG: N = 10)
Selective reporting (reporting bias)	Unclear risk	**Comment:** no clear indication of selective reporting, but insufficient information to permit judgement of 'high' or 'low'
Other bias	Low risk	**Performance bias** **Quote:** EG therapists: "All [DBT therapists] attended the weekly consultation group, and several received additional individual supervision from each other. Two clinicians received supervision briefly from a senior trainer from Linehan's group. [...] All individual and group sessions were videotaped for later coding for adherence using the DBT Expert Rating Scale [...] At the end of treatment, a sample of eight tapes from each therapist-patient dyad, including the first session and seven others selected randomly, was coded for adherence." (quote, p 377) CG therapists: "Five [out of eight TAU] clinicians [...] received weekly supervision on their cases from attending psychiatrists or staff psychologists." (quote, p 378) **Allegiance bias** **Comment:** no indication **Attention bias** **Comment:** equal amounts of attention paid to both groups

Kramer 2011

Study characteristics	
Methods	10-week trial with 2 arms 1. Motive-oriented therapeutic relationship + treatment as usual (MOTR + TAU) 2. Treatment-as-usual (TAU) **Duration of trial:** 10 weeks **Country:** Switzerland **Setting:** outpatient clinic
Participants	**Method of recruitment of participants:** not stated **Sample size:** 25 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** MOTR + TAU = 30.29 years (standard deviation = 12.43), TAU = 31.27 years (standard deviation = 8.21) **Sex:** 77% female

Kramer 2011 *(Continued)*

Comorbidity: panic disorder, agoraphobia, alcohol abuse, major depression, bulimia, anorexia, somatoform disorder

Inclusion criteria

1. Main diagnosis of borderline personality disorder
2. Between 18 and 60 years old
3. Able to speak French

Exclusion criteria

1. An organic disorder
2. A persistent substance abuse/dependence that might affect brain function (memory, level of consciousness, cognitive abilities)
3. A psychotic disorder implying pronounced break in reality testing (chronic or intermittent), such as schizophrenia, delusional disorder, bipolar affective disorder I
4. An acute risk of suicide
5. Severe cognitive impairment

Interventions	**Experimental group** **Treatment name:** MOTR + TAU **Number randomised to group:** 11 **Duration:** 10 weeks **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** not stated **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 14 **Duration:** 10 weeks **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** If necessary, short-term inpatient treatment was organised, as was adjunct pharmacotherapy **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Psychosocial functioning, assessed by social role subscale of the Outcome Questionnaire - 45.2 (OQ-45) **Secondary** 1. Interpersonal problems, assessed by the interpersonal problem subscale of OQ-45 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** not stated **Ethics approval:** The study was approved by the Ethics Committee of the Psychiatric Department involved. All patients gave written consent for the data to be used for research purposes. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** randomisation was performed by blocks of 10 participants, using a computer-based program

Kramer 2011 *(Continued)*

Allocation concealment (selection bias)	Low risk	**Comment:** The preparation of sealed envelopes containing information on the condition for each participant was done by an independent researcher.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** raters were unaware of the treatment condition.
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** in case of missing values, LOCF used. The process analyses were carried out on a restricted sample of 20 patients (TAU = 10; MOTR +TAU = 10), due to missing values (related to early terminations) of 5 individuals having completed too few sessions to be taken into account.
Selective reporting (reporting bias)	High risk	**Comment:** Borderline Symptoms List reported in the protocol did not appear in the publication.
Other bias	High risk	**Allegiance bias** **Comment:** Casper involved in the development of analysis plan **Attention bias** **Comment:** To counterbalance the increased time investment in condition 2, the therapists in condition 1 filled in a summary form on the patient's symptoms and problems.

Kramer 2014

Study characteristics	
Methods	10-session trial with 2 arms (endpoint data): 1. General psychiatric management (GPM) 2. Motive-oriented therapeutic relationship (MOTR) **Duration of trial:** 10 sessions **Country:** Switzerland **Setting:** Outpatient
Participants	**Method of recruitment of participants:** not stated **Sample size:** 85 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** DSM-IV diagnoses of borderline personality disorder were established by trained clinicians or clinician researchers for all patients using the Structured Clinical Interview (SCID-II) for DSM-IV **Mean age:** GPM = 30.95 years (standard deviation = 11). MOTR = 34.64 years (standard deviation = 9.97) **Sex:** 68.2% female **Comorbidity:** current DSM-IV diagnoses; depressive disorder = 56/74, anxiety disorder = 13/74, eating disorder = 10/74, substance abuse = 54/74, intelligence limitation = 6/74, sexual disorder = 9/74, attention disorder = 4/74. Axis II cluster A = 11/74, Axis II cluster B = 23/74, Axis II cluster C = 12/74 **Inclusion criteria** 1. Presence of a DSM-IV diagnosis of borderline personality disorder 2. Aged between 18 and 65 years old at time of recruitment

Kramer 2014 *(Continued)*

Exclusion criteria

1. Presence of a DSM-IV diagnosis of psychotic disorder, with mental retardation and substance abuse at the forefront. Minimal exclusion criteria were formulated in order to increase the external validity of the trial.

Interventions	**Experimental group** **Treatment name:** GPM **Number randomised to group:** 43; analysis on 38 only **Duration:** 10 sessions; no further information **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** 23/38 (61%) **Control/comparison group** **Comparison name:** MOTR **Number randomised to group:** 42; analysis on 36 only **Duration:**10 sessions; no further information **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** medication use at baseline: MOTR group 23/38 (61%), TAU group 21/36 (58%); χ^2=.04, P = 0.84 **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Borderline Symptom List (BSL-23) 2. Psychosocial functioning, assessed by the social role subscale of the Outcome Questionnaire – 45.2 (OQ-45) **Secondary** 1. Interpersonal problems, assessed by the social role subscale of the OQ-45 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes **Ethics approval:** The research protocol was approved by the local ethics board (clearance number 254/08), as well as the research committee of the university department. **Comments from review authors:** 1. All demographic data were based on the 74 participants who completed the trial. Missing data on the 11 participants who dropped out before the session were not reported.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** randomisation was performed using an internet-based block randomisation program; sealed envelopes were prepared by an independent researcher and opened when the patient accepted the study (p 179).
Allocation concealment (selection bias)	Low risk	**Comment:** sealed envelopes were prepared by an independent researcher and opened when the patient accepted the study (p 179).
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no information regarding blinding of outcome assessors

Kramer 2014 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** 11 participants dropped out before session two. No reasons provided. No reasons provided either for the 14 who discontinued the treatment. No demographic data on the entire sample (number of participants = 85). Imputation method used = LOCF
Selective reporting (reporting bias)	High risk	**Comment:** Working Alliance Inventory – Short Form, a self-report questionnaire was presented in the full report but there was no mention of this outcome in protocol.
Other bias	High risk	**Treatment adherence** **Comment:** adherence was assessed at the end of each of the 40 treatments (see p 180). **Attention bias** **Comment:** nothing found **Allegiance bias** Ueli Kramer, Franz Caspar & Martin Drapeau are all heavily linked to MOTR. **Vested interest** **Comment:** nothing found

Kramer 2016

Study characteristics	
Methods	1 year trial with 2 arms: 1. Dialectical behavior therapy (DBT) - informed skills training + TAU 2. Treatment-as-usual (TAU) **Duration of trial:** 1 year **Country:** Switzerland **Setting:** outpatient
Participants	**Method of recruitment of participants:** Each recruitment wave was advertised within the psychiatry department where the study took place, in addition to broader information in the community. In order to be included in the treatment, the patients met with the programme-related researcher for 1 to 2 screening sessions, which explained to them the study and the group treatment programme. **Sample size:** 41 **Diagnosis of Borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** DBT-informed skills training + TAU = 35.14 years (standard deviations = 9.67), TAU = 33.60 years (standard deviations = 8.57) **Sex:** 87.8% female **Comorbidity:** current DSM-IV diagnoses of depressive disorder, anxiety disorder, eating disorder, substance abuse, intelligence limitation, sexual disorder, attention disorder, axis II cluster A, axis II cluster B, axis II cluster C

Kramer 2016 *(Continued)*

	Inclusion criteria 1. Having a Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) (American Psychiatric Association, 1994) borderline personality disorder diagnosis 2. Being older than 18 years of age at the time of recruitment 3. Willing to participate in a 20-session skills group therapy, in addition to their individual treatment **Exclusion criteria** 1. Presence of a Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV) psychotic disorder or mental retardation 2. Patients who had already previously benefited from any form of Dialectical behavior therapy (DBT) treatment in their lives
Interventions	**Experimental group** **Treatment name:** DBT + TAU **Number randomised to group:** 21 **Duration:** 1 year **Concomitant psychotherapy:** Patients in both conditions received TAU, defined as individual treatment (i.e. psychotherapy and psychiatric treatment). **Concomitant pharmacotherapy:** medication = 15/21 (71%) **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 20 **Duration:** 1 year **Concomitant psychotherapy:** Patients in both conditions received TAU, defined as individual treatment (i.e. psychotherapy and psychiatric treatment). **Concomitant pharmacotherapy:** "Psychopharmacological medication was available, if indicated, for all patients as part of the TAU (in both psychiatric and psychotherapeutic models; Table 1). These frequencies were not different between the conditions [at baseline] (using chi-square statistics)." (p.194) Medication use at baseline: DBT-informed skills group 71%, TAU 65% (P = 0.66) **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Mental health status, assessed by the social role subscale of the Outcome Questionnaire - 45.2 (OQ-45.2) **Secondary** 1. Interpersonal problems, assessed by the interpersonal subscale of the OQ-45.2
Notes	**Sample size calculation:** yes **Ethics approval:** The research protocol was approved by the university and hospital research ethics board. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** an internet-based, block randomisation program was used for each of the 4 waves separately.

Kramer 2016 *(Continued)*

Allocation concealment (selection bias)	Low risk	**Comment:** sealed envelopes containing the allocated condition were prepared by an independent researcher and opened when a sufficient number of patients were recruited to form 2 treatment skills groups, together composing 1 recruitment wave.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** assessments and data handling were carried out mainly by 2 research assistants, with the help of a third; all blinded to participants' treatment condition.
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** in all ITT analyses a total of 41 patients were included (DBT ITT n = 21; TAU ITT n = 20); in all completer analyses, 31 patients were included (DBT completers n = 16; TAU completers n = 15); missing data resulted in the strategy of LOCF. 10 participants discontinued treatment (5 from DBT and 5 from TAU). It was not possible to collect research data for these patients at post-treatment and follow-up assessment points; discontinuation, if applicable, occurred between sessions 5 and 15.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol available
Other bias	Unclear risk	**Treatment adherence** **Comment:** treatment attrition concerned 10 (24%) patients in total, 5 (24%) for DBT and 5 (25%) for TAU. These numbers did not differ statistically ($\chi2(1) = 0.01$, $P = 0.93$) and were below the average reported in the literature for treatments lasting 1 year; moment of discontinuation was not different between the groups. Due to missing questionnaires post-treatment, the data point at the 3-month follow-up involved 33 observations (17 for DBT; 16 for TAU; 2 patients who had dropped out of treatment continued to fill in the questionnaires). **Allegiance bias** **Comment:** no apparent source of allegiance bias **Attention bias** **Comment:** appeared as if DBT participants were receiving more therapy time and in a more structured way. **Vested interest** **Comment:** no apparent conflicts of interest

Kredlow 2017a

Study characteristics	
Methods	4-6 month trial with 2 arms 1. Cognitive-behavioural treatment (CBT) 2. Treatment-as-usual (TAU) **Duration of trial:** 4-6 months **Setting:** outpatient clinics
Participants	**Method of recruitment of participants:** orientation meetings at outpatient centers, referral from clinicians

Kredlow 2017a *(Continued)*

Sample size: 27
Diagnosis of borderline personality disorder: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV)
Means of assessment: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II)
Mean age: 45.7 years (standard deviation = 9.6)
Sex: 96% female
Comorbidity: major depressive disorder = 67%, bipolar = 33%

Inclusion criteria

1. Aged 18 years or older
2. Severe mental illness diagnosis (i.e. DSM-IV, major depression, bipolar disorder, schizoaffective disorder, or schizophrenia) and current DSM-IV diagnosis of PTSD

Exclusion criteria

1. Psychiatric hospitalisation or suicide attempt in past 3 months
2. Current substance dependence

Interventions	**Experimental group** **Treatment name:** CBT **Number randomised to group:** 15 **Duration:** 4-6 months **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 12 **Duration:** 4-6 months **Both groups** **Concomitant psychotherapy:** yes, from local community centers **Concomitant pharmacotherapy:** yes, from local community centers **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary:** 1. Borderline personality disorder 2. PD severity, assessed by SCID-II for borderline personality disorder criteria 3. Mental health status, assessed by the Short Form-12 (SF-12) **Secondary** 1. Dissociation and psychotic-like symptoms, assessed by the Brief Psychiatric Rating Scale (BPRS) 2. Depression, assessed by the Beck Depression Inventory (BDI) 3. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** 1. participants in CBT improved significantly more in PTSD symptoms, depression, and self-reported physical health. Effects maintained 1-year post-treatment 2. We received some additional information from Dr Muser by email on 28 November 2017. He informed us that the trial was not registered, no protocol had been published, and that they did not assess the participants' IQ.

Risk of bias

Kredlow 2017a *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomization was conducted at a central location in the research center by a computer based randomization program with assignments not known in advance by either clinical or research staff."
Allocation concealment (selection bias)	Low risk	**Quote:** "Randomization was conducted at a central location in the research center by a computer based randomization program with assignments not known in advance by either clinical or research staff. When a client had completed the baseline assessment and his or her eligibility for the study was confirmed, the interviewer called the research center and a member of the research team obtained the randomized assignment from the computer. The client was informed about the assignment by the project coordinator".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quotes:** "All assessments were conducted by Masters or Ph.D. level trained clinical interviewers who were blind to treatment assignment."; "No specific instances of blind breaking were noted in the study".
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "There were no differences between the groups on any demographic, diagnostic, or baseline measures, nor in the rates of follow-up assessments".
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol was published and so a clear judgement could not be made.
Other bias	High risk	**Treatment adherence** **Quote:** "No efforts were made to control or modify any of these services provided to study participants." **Allegiance bias** **Comment:** KT Mueser is on the Committee on Research Agenda of the Association for the Advancement of Behavior Therapy, and the Task Force on Empirically Validated Treatments of the American Psychological Association, Division 12 (www.bu.edu/sargent/files/2013/05/MueserCV.pdf). **Attention bias** **Comment:** 12-16 sessions for EG, no information on length of TAU intervention **Vested interest** **Comment:** funded by National Institute of Mental Health

Kredlow 2017b

Study characteristics	
Methods	4-6 month trial with 2 arms 1. Cognitive-behavioural treatment (CBT) 2. Brief treatment: breathing, re-training, educational components like CBT, but without cognitive restructuring **Duration of trial:** 12-16 weeks **Country:** USA

Kredlow 2017b *(Continued)*

	Setting: partial hospital programmes and outpatient programmes
Participants	**Method of recruitment of participants:** contacted following administration of trauma and PTSD screening at 5 clinic sites **Sample size:** 55 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 40.4 years (standard deviation = 9.5) **Sex:** 78.2% female **Inclusion criteria** 1. Aged 18 years or older 2. Severe mental illness diagnosis (i.e. DSM-IV, major depression, bipolar disorder, schizoaffective disorder, or schizophrenia) and current DSM-IV diagnosis of PTSD 3. criteria for severe PTSD **Exclusion criteria** 1. Psychiatric hospitalisation or suicide attempt in past 3 months 2. Current substance dependence
Interventions	**Experimental group** **Treatment name:** CBT **Number randomised to group:** 29 **Duration:** 12-16 weeks **Control/comparison group** **Comparison name:** brief treatment programme **Number randomised to group:** 26 **Duration:** 3 sessions **Both groups** **Concomitant psychotherapy:** all continued to receive case management/usual psychiatric services (see p 502). **Concomitant pharmacotherapy:** all continued to receive pharmacological treatment.
Outcomes	**Primary:** 1. Mental health status, assessed by the Global Assessment of Functioning (GAF) **Secondary** 1. Depression, assessed by the BDI-II 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** 1. Greater improvements in PTSD symptoms and functioning in CBT group than in brief treatment group 2. Effects maintained at 1-year post-treatment 3. We received some additional information from Dr Muser by email on 28 November 2017. He informed us that the trial was not registered, no protocol had been published where the basic study methodology was described, and that they did not assess the participants' IQ.

Kredlow 2017b *(Continued)*

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomization was conducted at a central location in the research center by a computer based randomization program with assignments not known in advance by either clinical or research staff."
Allocation concealment (selection bias)	Low risk	**Quotes:** "Randomization was conducted at a central location in the research center by a computer based randomization program with assignments not known in advance by either clinical or research staff". "When a client had completed the baseline assessment and his or her eligibility for the study was confirmed, the interviewer called the research center and a member of the research team obtained the randomized assignment from the computer. The client was informed about the assignment by the project coordinator".
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quotea:** "All assessments were conducted by Masters or Ph.D. level trained clinical interviewers who were blind to treatment assignment.". "No specific instances of blind breaking were noted in the study".
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quote:** "There were no differences between the groups on any demographic, diagnostic, or baseline measures, nor in the rates of follow-up assessments".
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol published
Other bias	High risk	**Treatment adherence** **Quote:** "No efforts were made to control or modify any of these services provided to study participants." **Allegiance bias** **Comment:** KT Mueser is on the Committee on Research Agenda of the Association for the Advancement of Behavior Therapy, and the Task Force on Empirically Validated Treatments of the American Psychological Association, Division 12 (www.bu.edu/sargent/files/2013/05/MueserCV.pdf). **Attention bias** **Comment:** 12-16 sessions for EG, no information on length of TAU intervention **Vested interest** **Comment:** funded by National Institute of Mental Health

Laurenssen 2018

Study characteristics

Methods	6-month (on average) trial with 2 arms 1. Day hospital mentalisation-based treatment (MBT-DH) 2. Specialist treatment-as-usual (S-TAU) **Duration of trial:** 6 months, on average **Country:** The Netherlands

Laurenssen 2018 *(Continued)*

	Setting: inpatient and outpatient
Participants	**Method of recruitment of participants:** 2 mental healthcare centres, both located in Amsterdam, agreed to participate in this study. The City Crisis Service agreed to run the S-TAU condition. From March 2009 to July 2012, patients were referred to 1 of the 2 mental healthcare centers in Amsterdam. **Sample size:** 95 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis I Personality Disorders (SCID-I), and a total score on the Borderline Personality Disorder Severity Index (BPDSI) of at least 20, reflecting severe borderline personality disorder **Mean age:** not stated **Sex:** 79% female **Comorbidity:** avoidant personality disorder, antisocial personality disorder, paranoid personality disorder, obsessive-compulsive personality disorder, dependent personality disorder **Inclusion criteria** 1. Diagnosis of borderline personality disorder **Exclusion criteria** 1. Presence of schizophrenia or bipolar disorder, as determined by the Structured Clinical Interview for DSM-IV Axis I Personality Disorders (SCID-I) 2. Substance abuse requiring specialist treatment 3. Organic brain disorder 4. IQ below 80 5. Inadequate mastery of the Dutch language
Interventions	**Experimental group** **Treatment name:** MBT-DH **Number randomised to group:** 54 **Duration:** The mean number of days was 176 (range = 5–402, median = 149). The mean number of hours in MBT-DH was 1056 (range = 30–2412, median = 894). **Control/comparison group** **Comparison name:** S-TAU **Number randomised to group:** 41 **Duration:** The mean number of hours was 1473 (range = 5–13099, median = 131). **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** Patients could also consult a psychiatrist upon request and medication was prescribed following American Psychiatric Association guidelines (APA 2000). **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Dutch version of the Personality Assessment Inventory-Borderline (PAI-BOR) 2. Self-harm, assessed by the Suicide and Self-Harm Inventory (SSHI) (see Risk of bias in included studies) 3. Suicide-related outcomes, assessed by the SSHI (see Risk of bias in included studies) 4. Mental health status, assessed by the Global Severity Index (GSI) **Secondary** 1. Interpersonal problems, assessed by the Inventory of Interpersonal Problems (IIP)

Laurenssen 2018 *(Continued)*

2. Depression, assessed by the Beck Depression Inventory (BDI)
3. Attrition, in terms of patients lost after randomisation in each group

Notes	**Sample size calculation:** yes **Ethics approval:** yes, from the Medical Ethics Review Committee of the University of Rotterdam **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** patients agreeing to participate were randomly assigned to either MBT-DH or S-TAU using block randomisation taking into account the availability of treatment programs. For this reason, the randomisation was slightly skewed in favor of MBT- DH, because the new MBT-DH groups needed to be filled. (p 2)
Allocation concealment (selection bias)	Low risk	**Comment:** randomisation was done by an independent researcher, away from the site, using a computer algorithm. (p 2)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** research assistants were psychologists with an MSc degree, and were blind for treatment condition. (p 2)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** large attrition rates. Significantly differing rates after baseline. Unclear reasons for attrition. ITT analyses conducted. Multiple imputations conducted, but because imputed and non-imputed data were similar, imputed data were not reported.
Selective reporting (reporting bias)	High risk	**Comment:** self-harm, suicidal behaviour, subjective experiences of symptoms, personality functioning and treatment adherence listed as secondary outcomes in trial registry, but not reported on in study. **Quote:** "Preliminary screening of the data showed substantial differences in the administration of the SSHI between research assistants, and therefore we decided not to report data using this measure." (p 3, left column)
Other bias	High risk	**Adherence to treatment** **Comment:** adherence was not rated **Attention bias** **Comment:** differences in total hourly exposure between groups (mean 1473 versus 1056 hours) **Allegiance bias** **Comment:** Patrick Luyten has been involved in the training and dissemination of mentalisation-based treatments. The other authors declared no competing interests. (see p 7)

Leichsenring 2016

Study characteristics

Methods	2-3 month (approximately) trial with 3 arms

Leichsenring 2016 *(Continued)*

	1. Manual-guided psychoanalytic-interactional therapy (PIT) 2. Non-manualised psychodynamic therapy by experts in personality disorders (E-PDT) **Duration of trial:** mean = 77 to 107 days. PIT = 106.7 mean days (standard deviation = 41.71), E-PDT = and 76.78 mean days (standard deviation = 21.07) **Country:** Germany **Setting:** inpatient, Asklepios Clinic, Tiefenbrunn
Participants	**Method of recruitment of participants:** "Patients who applied for treatment and who had been given the presumptive diagnosis of a cluster B personality disorder by the referring clinician were asked to participate in the study." (quote, p 72) **Sample size:** 122 **Diagnosis of borderline personality disorder:** International Statistical Classification of Diseases and Related Health Problems, 10th version (ICD-10) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** PIT = 28.63 years (standard deviations = 8.71), E-PDT = 30.43 years (standard deviation = 9.05) **Sex:** 69% female **Comorbidity:** avoidant personality disorder in 14 patients (11%), histrionic personality disorder in 2 patients (2%), and narcisstic personality disorder in 28 patients (23%), assessed by SCID-II. Multiple diagnoses for cluster B personality disorders were possible. **Inclusion criteria** 1. Aged between 18 and 65 years 2. Diagnosis of a cluster B personality disorder according to SCID-II 3. Provided informed consent **Exclusion criteria** 1. Psychotic and acute substance-related disorders 2. Acute (uncontrollable) risk of suicide 3. Organic mental disorders 4. Severe medical conditions (according to ICD-10)
Interventions	**Experimental group** **Treatment name:** PIT **Number randomised to group:** 64 **Duration:** 106.7 mean days (standard deviation = 41.71) **Control/comparison group** **Comparison name:** E-PDT **Number randomised to group:** 58 **Duration:** 76.78 mean days (standard deviation = 21.07) **Both groups** **Concomitant psychotherapy:** none (inpatient) **Concomitant pharmacotherapy:** allowed **Proportions of participants taking standing psychotropic medication during trial observation period:** "In the PIT group, 37.5% received an antidepressive medication (selective serotonin reuptake inhibitors, noradrenalin reuptake inhibitors, or tricyclic antidepressants) as compared with 46.1% in the E- PDT group. The difference was not significant (p = 0.311). This was also true for neuroleptics (50 vs. 60.3%, p = 0.251) and anxiolytics (4.7 vs. 5.2%, p = 0.902). In total, 76% of the PIT patients and 79.3% of the E- PDT patients received temporarily some form of pharmacotherapy (p = 0.715). Thus, the two treatments did not differ with regard to the applied pharmacotherapy." (quote, p 76)
Outcomes	**Primary** 1. BPD severity, assessed by the Borderline Personality Inventory (BPI), total score

Leichsenring 2016 *(Continued)*

2. Psychosocial functioning, assessed by the Global Severity Index GSI of the Symptom Checklist-90 revised (SCL-90-R)

Secondary

1. Interpersonal problems, assessed by the Inventory of Interpersonal Problems (IIP)
2. Identity disturbance, assessed by the BPI, identity diffusion subscale
3. Depression, assessed by the Beck Depression Inventory
4. Adverse events (not reported by group)

Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** patients fulfilling the inclusion criteria were randomised to either PIT or E-PDT by use of a computer- generated randomisation list generated by two of the authors (UJ, OM). Randomisation was stratified for sex. (p 74)
Allocation concealment (selection bias)	Low risk	**Comment:** patients were randomised to treatment by use of a random function in Microsoft Excel. This was done by two of the authors (OM and UJ) not involved in any diagnostic assessments pre or post-therapy (third party assignment). Thus, the diagnosticians assessing and enrolling patients were unaware of the allocation sequence. (email correspondence 28 September 2018)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** 7 specifically trained and independent assessors conducted the interviews. (p 74)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** for ITT analysis, applied multiple imputation by chained equations to account for the uncertainty resulting from missing outcomes. To generate conservative estimates, 50 imputations were created and all available variables were included in the imputation process. (p 74)
Selective reporting (reporting bias)	High risk	**Comment:** Beck Anxiety Inventory was mentioned in protocol, but was not included in full report.
Other bias	High risk	**Adherence to treatment** **Comment:** 2 independent masked raters were trained in both PIT and the use of the checklist by one of the developers of PIT (US). They independently rated the 30 videotapes. Having seen the videos, they rated (1) whether PIT or E-PDT was applied and (2) the overall therapist's competence in applying principles of PIT. For the latter, a 4-point Likert rating scale was used comparable to the overall competence rating scale of the Penn Adherence and Competence Scale. (p 75) **Attention bias** **Comment:** large difference in duration in the 2 groups. Mean treatment duration was 106.70 days (SD = 41.71) for PIT and 76.78 days (SD = 21.07) for E-PDT. As this difference was statistically significant (P < 0.0001), treatment duration was included as a covariate in the statistical analysis. (p 75) **Allegiance bias**

Leichsenring 2016 *(Continued)*

Comment: last author, Ulrich Streeck, developed PIT

Leppänen 2016

Study characteristics	
Methods	1-year trial with 2 arms 1. Community treatment by experts (CTBE) 2. Treatment-as-usual (TAU) **Duration of trial:** 1 year **Country:** Finland **Setting:** social and health services, including mental services
Participants	**Method of recruitment of participants:** convenience sampling method **Sample size:** 71 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** CTBE = 31.9 years (standard deviation = 8.3), TAU = 32.3 years (standard deviation = 8.8) **Sex:** 85.9% female **Comorbidity:** not stated **Inclusion criteria** 1. Fulfilled SCID-II criteria for borderline personality disorder 2. Over 20 years of age 3. Suffered from severe symptoms of borderline personality disorder. Severe symptoms included parasuicidal behaviour (such as cutting, other forms of self-harm, impulsive overdosing of medicines), attempted suicide, considerable emotional instability affecting social and professional life, and previous unsuccessful treatments (1 or more), where the patient withdrew from treatment or was still suffering from severe symptoms despite treatment. **Exclusion criteria** 1. Schizophrenia spectrum diseases/psychoses 2. Bipolar disorder (type I) 3. Neuropsychiatric disorder 4. Severe substance abuse problem (which clearly impaired commitment to treatment) Axis I disorders were diagnosed according to Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) , and the presence of neuropsychiatric disorder and substance abuse was assessed by a clinician.
Interventions	**Experimental group** **Treatment name:** CTBE **Number randomised to group:** 24 **Duration:** 1 year (see p 218) **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** not stated **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 47 **Duration:** approximately 1 year

Leppänen 2016 *(Continued)*

	Concomitant psychotherapy: not stated **Concomitant pharmacotherapy:** not stated **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Finnish version of the Borderline Personality Disorder Severity Index, Fourth version (BPDSI-IV), total score 2. Suicide-related outcomes, assessed by the BPDSI-IV parasuicidality subcale **Secondary** 1. Anger, assessed by the BPDSI-IV outburst of anger subscale 2. Affective instability, assessed by the BPDSI-IV affective instability subscale 3. Chronic feelings of emptiness, assessed by the BPDSI-IV emptiness subscale 4. Impulsivity, assessed by the BPDSI-IV impulsivity subscale 5. Interpersonal problems, assessed by the BPDSI-IV unstable relationship subscale 6. Abandonment, assessed by the BPDSI-IV abandonment subscale 7. Identity disturbance, assessed by the BPDSI-IV identity disturbance subscale 8. Dissociation and psychotic-like symptoms assessed by the BPDSI-IV paranoid and dissociative ideation subscale 9. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** not stated **Ethics approval:** The Ethics Committee of Oulu University Hospital approved the study (18 June 2009, number: 41/2009). **Comments from review authors:** 1. Information about randomisation procedure, comorbid diagnoses, concomitant use of pharmacotherapy or psychotherapy (or both), and treatment adherence was received by email from Dr Leppänen on 20 December 2017.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** somewhat unclear, but seems likely that they are referring to a random number table. **Quote:** "The randomization list was prepared using appropriate statistical methods by a person who had no contact with the patients." (p 218)
Allocation concealment (selection bias)	Unclear risk	**Quote:** "The randomization list was prepared using appropriate statistical methods by a person who had no contact with the patients." (p 218) **Comment:** The person mentioned (s)he had no contact with patients, but could potentially have had contact with the researchers, enabling them to foresee assignments.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quotes:** measure 1: "BPDSI-IV interviews were blinded and conducted by three interviewers: two psychiatric nurses and a physician." (p 221); measure 2: "The 15D questionnaires were posted to patients, who were asked to return the completed questionnaire by pre-paid post." (p 221)

Leppänen 2016 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** higher attrition in TAU than CTBE – imbalance in numbers and reasons for dropout. 31.9% attrition in TAU may have affected effect size estimates in the continuous outcome measures.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol found
Other bias	High risk	**Treatment adherence** **Comment:** They did not mention it in the article but did state supervision in the active group (see p 219). Some may have considered this good but we do not think so, especially because it was not videotaped or manualised/rated. **Attention bias** **Comment:** Lack of attention to comorbidity and reporting of it. And use of convenience sampling. Potential type 1 and 2 errors **Quote:** "During the year long intervention, the CTBE patients made, on average, 73 visits to Oulu mental health services compared to an average of only 21 visits in TAU patients. Therefore, the possibility of nonspecific treatment effects may also exist". (p 228) **Other risk of bias** **Quote:** "The likelihood for Type I and Type II errors cannot be excluded, since many statistical comparisons were performed and the subsamples in some statistical analyses may have been too small, thus reducing the statistical power and likelihood of revealing truly significant findings. We considered correcting for multiple comparisons but, due to our limited sample size, such corrections were considered to be rather artificial." (p 226)

Lin 2019

Study characteristics	
Methods	8-week trial with 2 arms: 1. Dialectical behavior therapy skills training group (DBTSTG) 2. Cognitive therapy group (CTG) **Duration of trial:** 8 weeks **Country:** Taiwan **Setting:** outpatient
Participants	**Method of recruitment of participants:** "A total of 256 college students recruited from two university counseling centers (UCC) in southern Taiwan participated in this study." (quote, p 3) **Sample size:** 82 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** DBTSTG = 20.40 years (standard deviation = 0.76), CTG = 20.47 years (standard deviation = 0.71) **Sex:** 87.8% female **Comorbidity:** not stated **Inclusion criteria**

Lin 2019 *(Continued)*

1. Met criteria for borderline personality disorder
2. Having experienced at least 1 suicide attempt in the past 6 months

Exclusion criteria

1. A lifetime diagnosis of schizophrenia, schizoaffective disorder, bipolar disorder, psychotic disorder
2. A current severe depression and suicide risk indicating the need for inpatient care and crisis intervention
3. Experiencing current neurological signs and substance abuse during the last 6 months

Interventions	**Experimental group** **Treatment name:** DBTSTG **Number randomised to group:** 42 **Duration:** 8 weeks **Control/comparison group** **Comparison name:** CTG **Number randomised to group:** 40 **Duration:** 8 weeks **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** none **Proportions of participants taking standing psychotropic medication during trial observation period:** "No participants were currently receiving psychotropic medications." (p. 4)
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by Borderline Personality Disorder Features Scale (BPDFS), a self-report questionnaire designed by Ko and colleagues in reference to the personality disorder diagnosis from the DSM-IV 2. Suicide-related outcomes, assessed by the 12-item Adult Suicidal Ideation Questionnaire - Shortened version (ASIQ-S) **Secondary** 1. Depression, assessed by Ko´s Depression Inventory (KDI) 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Following the completion of the intake assessments, eligible participants were referred by counseling centers based on freshman screening during 2009–2014, and were randomly assigned to either the CTG or the DBTSTG for intervention using a computerized randomization procedure with a maximum of 9 cases in one group." (p 86)
Allocation concealment (selection bias)	Unclear risk	**Comment:** not enough clear information provided in order for a judgement to be made
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Quote:** "Blinded assessments were conducted at the baseline and follow-up; however, blinded assessments during intervention were not possible since the assessment of a suicide attempt involved an evaluation of the circumstances

Lin 2019 *(Continued)*

		preceding a suicide attempt and the use of mental health services during post-attempt, which was essential for clinical management." (p 87)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quotes:** "Generalized linear model analyses were performed to compare participants who were included vs. those who were not included by group (DBTSTG vs. CTG) on the demographic and outcome variables at baseline. Intent- to-treat analyses were conducted to aid in the interpretation of findings by including all those who started treatment but dropped out." (p 89) "Sixty-eight participants, including 36 (85.7%) in DBTSTG and 32 (80.0%) in CTG, completed the intervention. There were no intergroup differences in dropout rates (DBTSTG: 14.28%; CTG: 20.00%)....Further comparisons between participants who completed (n = 68) and non-completed (n = 14) across intervention groups on gender were not significant ($\chi 2$ = .75, p = .85; $\chi 2$ = .42, p = .47). Moreover, the effects of the sample (included vs. non-included) x group (DBTSTG vs. CTG) on age, depression and antecedent and response-focused emotion regulation measures at baseline did not reach significant differences (age: F = .01 p = .69; depression: F = .01 p = .986; cognitive errors: F = .21, p = .74; attentional deployment: F = .02, p = .89, cognitive reappraisal: F = 1.51, p = .219; suppression: F = .75, P = .38 acceptance: F = 3.00, p = .08)." (p 89)
Selective reporting (reporting bias)	High risk	**Comment:** protocol available; data from the Emotion Regulation Scale and Symptom Check List - 90 - Revised not reported in full report
Other bias	Unclear risk	**Attention bias** **Comment:** nothing found **Treatment adherence** **Comment:** no ratings **Quote:** "Although each session in both conditions was guided by an intervention manual, and the therapist was required to strictly adhere to the intervention manual and rate the checklists for adherence to the CGT or DSTG manual in an attempt to reduce treatment diffusion, future studies should include independent adherence ratings by objective observers". (p 95) **Allegiance bias** **Comment:** no evidence of allegiance bias found

Linehan 1991

Study characteristics	
Methods	12-month trial with 2 arms 1. Dialectical behavior therapy (DBT) 2. Treatment-as-usual (TAU) **Duration of trial:** 12 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size**: 62

Linehan 1991 *(Continued)*

Diagnosis of borderline personality disorder: Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition (DSM-III)

Means of assessment: Revised Diagnostic Interview for Borderlines (DIB-R)

Age: not stated

Sex: 100% female

Comorbidity: not stated

Inclusion criteria:

1. Scored at least 7, out of a maximum score of 10, on the Diagnostic Interview for Borderlines and met DSM-III criteria for borderline personality disorder
2. Had at least 2 incidents of parasuicide in the last 5 years, with 1 during the last 8 weeks
3. Did not meet DSM-III criteria for schizophrenia, bipolar disorder, substance dependence, or mental retardation
4. Aged between 18 and 45 years
5. Agreed to the study conditions, including termination from other individual psychotherapy if assigned to DBT

Exclusion criteria

1. Schizophrenia
2. Bipolar disorder
3. Substance dependence
4. Mental retardation

Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 2 **Duration:** 12 months (weekly individual therapy, weekly group therapy, telephone contact with the individual therapist between sessions) **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 22 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** 13 out of 22 TAU participants were in ongoing individual psychotherapy at pretreatment, 9 out of 22 TAU participants had stable individual therapy for the year. **Concomitant pharmacotherapy:** "Subjects had to consent to taper off psychotropic medications before entering the study. However, once in the study, failure to terminate or resuming use of medication was not cause for removal from the study." (quote, p 1061) **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Number of patients with self-harming behaviour in the previous 12-month period
Notes	**Sample size calculation:** not stated

Linehan 1991 *(Continued)*

Ethics approval: not stated

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Subjects were matched on the number of lifetime parasuicides and psychiatric hospitalization, age, and good vs poor clinical prognosis (with a subthreshold diagnosis on schizophrenia or substance dependence constituting poor prognosis) and randomly assigned to a treatment condition." (p 1061)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear details provided
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Screening and assessment interviews were administered by a team of 13 research assessors. Every effort was made to keep the assessors blind about treatment condition." (p 1061)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** 10 dropped out during pretreatment assessment (EG: N = 5, CG: N = 5). 7 were dropped following pretreatment assessment for refusal or inability to meet study conditions (EG: N = 3, CG: N = 4). 2 EG participants quit the study with 4 or fewer DBT sessions and were dropped from all analyses other than treatment maintenance analyses. Major analyses were conducted for 44 participants, N = 22 in EG and N = 22 in CG treatment.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication for selective reporting, but Insufficient information to permit judgement of 'high' or 'low' risk of bias
Other bias	Unclear risk	**Comment:** no further details

Linehan 1994

Study characteristics

Methods	12-months trial with 2 arms 1. Dialectical behavior therapy (DBT) 2. Treatment-as-usual (TAU) **Duration of trial**: 12 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 26 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition (DSM-III) **Means of assessment:** Structured Clinical Interview for DSM-IV (SCID), and Revised Diagnostic Interview for Borderlines (DIB-R) **Mean age:** 26.7 years (standard deviation = 7.8)

Linehan 1994 *(Continued)*

Sex: 100% female

Comorbidity: not stated

Inclusion criteria

1. Scored at least 7, out of a maximum score of 10, on the Diagnostic Interview for Borderlines and met DSM-III criteria for borderline personality disorder
2. Had at least 2 incidents of parasuicide in the last 5 years, with 1 during the last 8 weeks
3. Did not meet DSM-III criteria for schizophrenia, bipolar disorder, substance dependence, or mental retardation
4. Aged between 18 and 45 years
5. Agreed to the study conditions, including termination from other individual psychotherapy if assigned to DBT

Exclusion criteria

1. Participants currently meeting criteria for schizophrenia, bipolar disorder, primary substance dependence, mental retardation

Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 13 **Duration:** 12 months (weekly individual behavioural psychotherapy, weekly psychoeducational skills training groups) **Control/comparison group** **Comparison name:** TAU; participants received alternative therapy referrals and were allowed to participate in any type of treatment available in the community **Number randomised to group:** 13 **Duration:** 12 months (weekly individual behavioural psychotherapy, weekly psychoeducational skills training groups) **Both groups** **Concomitant psychotherapy:** patients assigned to DBT treatment had to terminate other professional mental healthcare. **Concomitant pharmacotherapy:** no between-group differences in number of participants using psychotropic medications at pretreatment (use of: antidepressants, anticonvulsants, lithium, anxiolytics) **Proportions of participants taking standing psychotropic medication during trial observation period:** DBT participants should have tapered off psychotropic medications as 1 goal of therapy, and 8 out of 13 discontinued medication before start of treatment. The remaining 5 DBT participants reported using a mean of 1.80 medications (sedatives, antidepressants, anxiolytics, lithium) over the treatment year, while 9 out of 13 TAU participants reported using a mean of 3.89 different medications (antidepressants, anxiolytics, neuroleptics, sedatives, anticonvulsants).
Outcomes	**Primary** 1. Mental health status, assessed with Goal Attainment Scale (GAS) **Secondary**

Linehan 1994 *(Continued)*

1. Anger, assessed with the Søgeresultater Webresultater State-Trait Anger Expression Inventory (STAXI-Anger)

Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quotes:** "assignment of subjects to treatment conditions [...] described in detail in the original outcome study [i.e. Linehan 1991]" (p 1772). "Subjects were matched on the number of lifetime parasuicides and psychiatric hospitalization, age, and good vs poor clinical prognosis (with a subthreshold diagnosis on schizophrenia or substance dependence constituting poor prognosis) and randomly assigned to a treatment condition." (Linehan 1991, p 1061) **Comment:** no further details
Allocation concealment (selection bias)	Unclear risk	**Comments:** no further details
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Interviews blind to treatment conditions" (p 1772)
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** analyses were conducted on a per protocol basis. 26 women included, data set for 26 participants (DBT: N = 13, TAU: N = 13) provided
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting, but insufficient information to permit judgement of 'high' or 'low' risk of bias
Other bias	High risk	**Performance bias** **Comment:** no details provided to indicate if supervision or adherence ratings (or both) had been conducted. However, the same study design was used as for Linehan 1991 ("two cohorts", cf. Linehan 1994, p 1772), where regular supervision was explicitely defined (cf. Characteristics of included studies, Risk of bias table for Linehan 1991). **Allegiance bias** **Comment:** "study was conducted at the institution where the treatment was developed." (p 1775) **Attention bias** **Comment:** more attention paid to DBT group

Linehan 2006

Study characteristics

Methods	12-month trial with 2 arms

Linehan 2006 *(Continued)*

1. Dialectical behaviour therapy (DBT)
2. Non-behavioural community treatment by experts (CTBE)

Duration of trial: 12 months

Country: USA

Setting: outpatient

Participants	**Method of recruitment of participants:** not stated **Sample size**: 101 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and International personality disorder examination (IPDE) **Mean age:** 29.3 years (standard deviation = 7.5) **Sex:** 100% female **Comorbidity:** Current psychiatric diagnoses (DSM-IV): Major depressive disorder 72.3%, panic disorder 40.6%, PTSD 49.5%, any anxiety disorder 78.2%, any substance use disorder 29.7%, any eating disorder 23.8%, Cluster A PD 1.3%, Cluster B other than BPD 10.9%, Cluster C PD 25.7%. Prevalence rates did not differ significantly between the two treatment groups. **Inclusion criteria:** not stated **Exclusion criteria** 1. Lifetime diagnosis of schizophrenia 2. Schizoaffective disorder 3. Bipolar disorder 4. Psychotic disorder not otherwise specified 5. Mental retardation 6. Seizure disorder requiring medication 7. Mandate to treatment 8. Need for primary treatment for another debilitating condition
Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 52 **Duration:** 12 months (weekly individual psychotherapy, group skills training, telephone consultation) **Control/comparison group** **Comparison name:** CTBE **Number randomised to group:** 49 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** no information given regarding further concomitant psychotherapy **Concomitant pharmacotherapy:** There were no differences in the types or amounts of psychotropic medication used at pretreatment.

Linehan 2006 *(Continued)*

	Proportions of participants taking standing psychotropic medication during trial observation period: exact proportions unclear. The use of psychotropic medications decreased significantly more in the DBT than the CTBE group during the treatment year.
Outcomes	**Primary** 1. Suicidality, assessed with the Suicide Behaviors Questionnaire (SBQ) **Secondary** 1. Depression, assessed with the Hamilton Depression Scale, 17 items (HAM-D-17)
Notes	**Sample size calculation:** yes **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quotes:** "Using a computerized adaptive minimization randomization procedure, eligible subjects were matched to treatment condition on 5 primary prognostic variables: (1 and 2) the number of lifetime suicide attempts or nonsuicidal self-injuries combined and psychiatric hospitalizations; (3) a history of only suicide attempts, only nonsuicidal self-injury, or both; (4) age; and (5) a negative prognostic indicator of a Beck Depression Inventory score higher than 30 or a Global Assessment of Functioning score lower than 45 for a comorbid condition [...] Based on 0.8 power to detect significant differences between conditions (P = .05, 1-sided), this procedure was used to randomize 101 subjects to DBT (n = 52) or to CTBE (n = 49)." (p 758)." "The randomization program assigned clients to DBT and CTBE therapists, matching on sex, doctoral vs master's training, and years of clinical experience. Results indicated that therapists' sex and training did not differ in the 2 conditions. The CTBE therapists, however, had more clinical experience, which was expected because they were selected for their expertise." (p 760)
Allocation concealment (selection bias)	Low risk	**Quote:** "The participant coordinator, who was not blinded to treatment condition, executed the randomization program". (p 758) **Comment:** improbable that computerised assignment could be foreseen and thus bias be introduced
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Assessments were conducted by blinded independent clinical assessors". (p 758)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** analyses were conducted on an ITT basis. 101 participants randomised, and 60 allocated to the EG and 51 to the CG arms. 8 DBT "training cases" and 2 CBT "pilot cases" excluded from analyses, but the remaining 52 EG and 49 CG participants were analysed regardless of discontinuation or getting lost to follow-up.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no clear indication of selective reporting, but there was insufficient information to permit a judgement of 'high' or 'low' risk of bias
Other bias	High risk	**Performance bias** **Quote:** "Psychotherapists recommended by colleagues as potentially good DBT therapists were recruited for the study; 8 had no previous DBT exposure

Linehan 2006 *(Continued)*

and 8 had experience that ranged from workshop attendance to applied practice. [...] Training consisted of a 45-hour DBT seminar followed by supervised practice. [...] Individual therapists were hired once 6 of 8 consecutive training case sessions were rated as adherent to DBT. During the study, adherence was assessed by coding a random selection of sessions on the DBT Global Rating Scale [...] which codes DBT adherence." (p 759)

Allegiance bias

Comment: the primary author (MLL) is developer of DBT

Attention bias

Comment: equal amounts of attention spent to both groups

Vested interest

Comment: first author is the developer of Dialectical Behavioural Therapy (DBT) – Source: linehaninstitute.org/about/organizations

Linehan 2015a

Study characteristics

Methods	49-week trial with 3 arms 1. Standard dialectical behaviour therapy (DBT) 2. Dialectical behaviour therapy - individual, no groups (DBT-I) 3. Group dialectical behaviour therapy, no individual (DBT-S) **Duration of trial:** 49 weeks **Country:** USA **Setting:** university clinic and community setting
Participants	**Method of recruitment of participants:** outreach to healthcare practitioners **Sample size:** 99 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and International personality disorder examination (IPDE) **Mean age:** 30.3 years (range = 18-60) **Sex:** 100% female **Comorbidity:** not stated **Inclusion criteria** 1. Met criteria for borderline personality disorder on the IPDE and the SCID-II 2. At least 2 suicide attempts or non-suicidal self-injury (NSSI) episodes (act), or both, in the past 5 years 3. At least 1 suicide attempt in the 8-week period before entering the study 4. At least 1 suicide attempt in the past year **Exclusion criteria** 1. IQ below 70

Linehan 2015a *(Continued)*

2. Current psychotic or bipolar condition
3. Seizure disorder
4. Required primary treatment for another life threatening disorder (e.g. severe anorexia nervosa)

Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 33 **Duration:** 52 weeks **Control/comparison group 1** **Comparison name:** DBT-I **Number randomised to group:** 33 **Duration:** 49 weeks **Control/comparison group 2** **Comparison name:** DBT-S **Number randomised to group:** 33 **Duration:** 50 weeks **All groups:** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** psychotropic medication allowed **Proportions of participants taking standing psychotropic medication during trial observation period:** exact proportions unclear, but no between-group differences in use of psychotropic medications
Outcomes	**Primary** 1. Self-harm, in terms of proportion of patients with non-suicidal self-injury (NSSI) (count data) 2. Suicide-related outcomes, assessed by the proportion of patients with suicidal act **Secondary** 1. Depression, assessed by the Hamilton Depression Rating Scale (HDRS) 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample calculation:** yes **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "A computerized adaptive randomization procedure (5) matched participants on age, number of suicide attempts, number of NSSI episodes, psychiatric hospitalizations in the past year, and depression severity". (p 476)
Allocation concealment (selection bias)	Unclear risk	**Quote:** "The participant coordinator, who was not blinded to the treatment condition, executed the randomization and collected treatment-related data". (p 476)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Assessments were conducted before treatment and quarterly during 1 year of treatment and 1 year of follow-up by blinded independent assessors trained by instrument developers or approved trainers (including K.A.C. and A.M.M.-G.) and evaluated as reliable for each instrument." (p 476)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no information on ITT, but all randomised participants were included in analysis, so ITT was likely used. No imputation methods seem to have been used. 26/99 randomised were lost at follow-up. No differences in

Linehan 2015a *(Continued)*

		rate of dropouts between arms, no evidence that group differences in missing data biased major outcome variables
Selective reporting (reporting bias)	High risk	**Comment:** protocol lists 'coping skills' as a secondary outcome. It was not included in study. 'Reasons for living' and depression and anxiety outcome measures were included in the paper. These were not listed in the protocol. Neither were they mentioned in the paper as post hoc analyses
Other bias	High risk	**Treatment adherence** **Comment:** treatment adherence differed significantly between 2 out of 3 groups **Adherence bias** **Comment:** first author is the developer of Dialectical Behavioural Therapy (DBT), see http://www.linehaninstitute.org/ab out-Linehan.php **Attention bias** **Quote:** "Participants in standard DBT received significantly more individual sessions than those in DBT-S owing to weekly sessions in standard DBT and as-needed sessions in DBT-S. Participants in standard DBT and DBT-S received more group therapy sessions than those in DBT-I owing to the optional nature of group therapy in DBT-I. Participants in standard DBT attended more groups than those in DBT-S owing to trend-level differences in treatment retention." (p 477)

McMain 2009

Study characteristics	
Methods	12-months trial with 2 arms 1. Dialectical behaviour therapy (DBT) 2. General psychiatric management **Duration of trial:** 12 months **Country:** Canada **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 190 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: International Personality Disorder Examination (IPDE) **Mean age:** 30.4 years (standard deviation = 9.9) **Sex:** 86.8% female **Comorbidity:** exclusion of several disorders **Inclusion criteria** 1. Meet diagnostic and DSM-IV criteria for borderline personality disorder 2. Aged 18–60 years

McMain 2009 *(Continued)*

3. Have had at least 2 episodes of suicidal or nonsuicidal self-injurious episodes in the past 5 years, at least 1 of which was in the 3 months preceding enrollment

Exclusion criteria

1. Psychotic disorder
2. Bipolar I disorder
3. Delirium
4. Dementia
5. Mental retardation
6. Diagnosis of substance dependence in preceding 30 days
7. Having a medical condition that precluded psychiatric medications
8. Living outside a 40-mile radius of Toronto
9. Serious medical condition likely to require hospitalisation within the next year
10. Having plans to leave the province

Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 90 **Duration:** 12 months (individual sessions 1-hour weekly; skills group 2 hours weekly; phone coaching 2 hours weekly; consultation team for therapists 2 hours weekly) **Control/comparison group** **Comparison name:** general psychiatric management according to American Psychological Association (APA) guideline recommendations **Number randomised to group:** 90 **Duration:** 12 months (individual sessions, 1-hour weekly, including management based on structured drug algorithm, and therapist supervision meeting 90 minutes weekly) **Both groups** **Concomitant psychotherapy:** non-study treatments, such as individual, group, case management, day or inpatient treatment were recorded but participants were not prevented from using them. **Concomitant pharmacotherapy:** At baseline, 145 patients (81.6%) reported that they were taking psychotropic medications (mean number of medications, 3.08 [SD = 1.64]). **Proportions of participants taking standing psychotropic medication during trial observation period:** Exact proportions unclear; during treatment, patients in dialectical behavior therapy averaged 1.84 (SD = 1.44) medications, and those in general psychiatric management 2.09 (SD = 1.65), with no significant difference between groups.
Outcomes	**Primary** 1. BPD severity, assessed by Zanarini Rating Scale for Borderline Personality disorder (ZAN-BPD) 2. Parasuicidality, assessed by mean number of suicidal and self-injurious episodes **Secondary** 1. Anger, assessed by State-Trait Anger Expression Inventory (STAXI) 2. Interpersonal problems, assessed by Inventory of Interpersonal Problems-Circumplex (IIP-C) 3. Depression, assessed by Beck Depression Inventory (BDI)
Notes	**Sample size calcuation:** yes

McMain 2009 *(Continued)*

Ethics approval: The protocol was approved by each centre's research ethics board, and patients provided written informed consent prior to enrollment. Under the Canadia public healthcare system, participants did not pay for treatment.

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "eligible participants were randomly assigned to treatment arms using a pregenerated block randomization scheme developed and held by the statistician." (p 1366)
Allocation concealment (selection bias)	Low risk	**Quote:** "[...] statistician, who prepared 45 sealed envelopes, each containing the group allocations in random order for four participants." (p 1366)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "[...] assessors who were well trained on study instruments and blind to treatment assignment. [...] Assessors were polled after the treatment phase to ascertain whether they could correctly guess participants' treatment assignment; they did not know treatment assignment for 86% of the cases, suggesting that blinding was largely maintained." (p 1366)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no further details
Selective reporting (reporting bias)	Low risk	**Comment:** study protocol available (NCT00154154). No indication of selective reporting
Other bias	Unclear risk	**Comment:** no further details

McMain 2017

Study characteristics

Methods

20-week trial with 2 arms

1. Dialectical behavior therapy (DBT) skills training group
2. Active waiting list. At the end of the study, participants assigned to the waiting-list group were offered a place in treatment. During this waiting period, participants could continue with treatment-as-usual care (medication management or other psychosocial treatments).

Duration of trial: 20 weeks

Country: Canada

Setting: outpatient

Participants

Method of recruitment of participants: not stated

Sample size: 84
Diagnosis of borderline personality disorder: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV)

Means of assessment: International Personality Disorder examination (IPDE)

Mean age: 29.67 years (standard deviation = 8.62)

McMain 2017 *(Continued)*

Sex: 78.6% female

Comorbidity: current DSM-IV axis I and axis II diagnoses: major depressive disorder, panic disorder, post-traumatic stress disorder (PTSD), any anxiety disorders, substance abuse, substance dependence, any eating disorder

Inclusion criteria

1. Meeting the criteria for borderline personality disorder as defined in the DSM-IV
2. Aged 18-60 years
3. Two suicidal or non-suicidal self-harm, or both (NSSI (episodes in the past 5 years, with 1 occurring within 10 weeks prior to enrolment))
4. Able to understand written and spoken English

Exclusion criteria

1. Meeting DSM-IV criteria for a psychotic disorder, bipolar I disorder or dementia
2. Evidence of an organic brain syndrome or mental retardation based on clinical interview
3. Participation in a DBT programme within the past year

Interventions	**Experimental group** **Treatment name:** DBT skills training group **Number randomised to group:** 42 **Duration:** 20 weeks **Control/comparison group** **Comparison name:** waiting list **Number randomised to group:** 42 **Duration:** 20 weeks **Both groups** **Concomitant psychotherapy:** "At baseline, a total of 71 patients (85%) reported that they were receiving some form of psychosocial treatment from a therapist. During their period on wait list, participants could continue with treatment as usual (medication management or other psychosocial treatments)". (quote, p 140) **Concomitant pharmacotherapy: "**At baseline, a total of 71 patients (86%) were taking psychotropic medications, with a mean of 1.79 ± 1.41 medications per participant. There were no significant between-group differences in either the number of patients on medication (DBT = 33/42; WL = 38/42; v2(1) = 1.67, P = 0.20) or the mean number of medications taken (DBT = 1.52 ± 0.20; WL = 2.05 ± 0.22; t(80) = 1.73, P > 0.05)." **Proportions of participants taking standing psychotropic medication during trial observation period: "**At 20 weeks, a total of 57 patients (81%) were taking medication and were averaging 1.62 ± 1.67 medications, with the DBT group reporting both fewer patients on medication (23/32) compared to the WL patients (34/38) and fewer medications (1.52 ± 0.20 vs. 2.05 ± 0.22, t(80) = 2.10, P = 0.04). There was no significant group difference in the average number of medications at the 32-week follow-up (t(80) = 0.53, P = 0.60)“. (p. 142)
Outcomes	**Primary** 1. Borderline Personality Disorder symptom severity, assessed by the Borderline Symptom List- 23 (BSL-23) 2. Self-harm, assessed by the self-report Deliberate Self-Harm Inventory (DSHI) 3. Suicide-related outcomes, assessed by the clinician-administered Lifetime Suicide Attempt Self-Injury Interview (LSASI) 4. Psychosocial functioning, assessed by the Symptom Checklist 90 Revised – total score (SCL-90-R) **Secondary** 1. Anger, assessed by the State-Trait Anger Expression Inventory, anger expression out scale score (STAXI-A)

McMain 2017 *(Continued)*

2. Affective instability, assessed by the Difficulties in Emotion Regulation Scale (DERS)
3. Impulsivity, assessed by the Barrett Impulsiveness Scale-11 (BIS-11)
4. Interpersonal problems, assessed by the Social Adjustment Scale – Self-Report (SAS-SR)
5. Depression, assessed by the Beck Depression Inventory (BDI)
6. Attrition, in terms of patients lost after randomisation in each group, and as measured by the Reasons for Early Termination from Treatment Questionnaire

Notes	**Sample size calculation:** yes **Ethics approval:** yes. The study was approved by the CAMH Research Ethics Board. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** participants were assigned to groups using a standard random block design in block sizes of four.
Allocation concealment (selection bias)	Low risk	**Comment:** statistician prepared 42 envelopes, each containing 2 allocations to each of the conditions in random order.
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** participants were assessed by 2 doctoral-level psychology students and 1 master's-level clinician who were well trained on the study instruments and were blinded to treatment assignment.
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** all analyses were conducted on the ITT sample (N = 84). Low attrition rate (5 in DBT, 3 on waiting list; reasons for dropout were stated) **Quote:** "There was no evidence that missing data patterns were biased by group membership". (p 142)
Selective reporting (reporting bias)	Low risk	**Comment:** protocol published. All outcomes mentioned in the publication except the Borderline Evaluation of Severity over time Scale (secondary outcome), which seems to have been changed to the Borderline Symptom List - 23. Some other outcomes have been added in the publication as well (Beck Depression Inventory - II, the Social Adjustment Scale - Self-report, the Difficulties in Emotion Regulation Scale, the Distress Tolerance Scale and the Kentucky Inventory of Mindfulness Scale).
Other bias	Unclear risk	**Treatment adherence** **Comment:** Treatment adherence ratings were conducted on 10% (n = 22) of sessions. The mean score of 4.44 (SD = 0.11) fell within the 'adherent' range. **Attention bias** **Comment:** comparator intervention was waiting list. **Allegiance bias** **Comment:** authors reported no conflict of interests in relationship to this study. **Vested interest** **Comment:** no indication of bias

McMurran 2016

Study characteristics	
Methods	12-week trial with 2 arms 1. Psychoeducation and problem solving (PEPS) therapy, internet-based control group with no psychoeducation + treatment-as-usual (TAU) 2. TAU **Duration of trial:** 12 weeks **Country:** UK **Setting:** community (outpatient)
Participants	**Methods of recruitment of participants:** referred to PEPS team. Participants were recruited from mental health services in 3 UK NHS trusts. **Sample size:** subsample = 183 **Diagnosis of borderline personality disorder**: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: International personality disorder examination (IPDE) **Mean age:** no data on subsample. Full sample for PEPS therapy = 38.6 years (standard deviation = 10.9), full sample for TAU = 37.8 years (standard deviation = 11) **Sex:** approximately 75% female **Comorbidity**: not stated **Inclusion criteria** 1. At the point of randomisation, participants were required to have one or more personal disorder(s) (including personality disorder not otherwise specified), identified through the IPDE (Loranger 1995) 2. Aged 18 years or over 3. Living in the community 4. Proficient in spoken English 5. Had capacity to provide informed consent **Exclusion criteria** 1. A primary diagnosis of major functional psychosis 2. Insufficient degree of literacy 3. Incomprehension or lack of attention to be able to engage in trial therapy and assessments 4. Engagement in a specific programme of psychological treatment for personality disorder or likely to start such treatment during the trial period 5. Participation in any other trial
Interventions	**Experimental group** **Treatment name:** PEPS therapy, internet-based control group with no psychoeducation + TAU **Number randomised to group:** 93 **Duration:** 12 weeks **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 90 **Duration:** 12 weeks **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** allowed

McMurran 2016 *(Continued)*

	Proportions of participants taking standing psychotropic medication during trial observation period: unclear
Outcomes	**Primary** 1. Psychosocial functioning, assesed by the Social Functioning Questionnaire (SFQ) **Secondary** 1. Depression, assessed by the Hospital Anxiety and Depression Scale (HADS) 2. Attrition, in terms of patients lost after randomisation in each group 3. Adverse effects (AE), as assessed by the total number of adverse effects in each group. AE was defined as death for any reason, inhospitalisation for any reason and any other serious, unexpected AE.
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** 1. We received additional data on BPD subgroups by email from Dr Murran in 2017 and again in 2018.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Randomisation was based on a computer generated pseudo-random code using random permuted blocks of randomly varying size created by the Nottingham Clinical Trials Unit [NCTU] in accordance with their standard operating procedure and held on a secure server. Allocation was stratified by recruiting centre and sex." (p xxiv)
Allocation concealment (selection bias)	Low risk	**Quote:** "The sequence of treatment allocations was concealed until recruitment, data collection, and all other trial-related assessments were complete. The investigator, or an authorised designee, accessed the treatment allocation for each participant by means of a remote, internet-based randomisation system developed and maintained by the NCTU. Allocation was therefore fully concealed from recruiting staff." (p 14)
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "At the start of each follow-up, participants were reminded of the importance of not disclosing their treatment allocation to the research assistant using a suggested unblinding script (See Appendix 9). If the research assistant was inadvertently unblinded to treatment allocation before completing the final follow-up, a record of the incident of unblinding was made. Researchers also reported whether or not they were aware of the treatment allocation at the time of completing the primary end-point assessments. Owing to changes in personnel over the course of the trial, in some cases, end-point assessments were conducted by researchers who were not unblinded. A record was made of the blinding status of the researcher conducting the final follow-up data collection." (p 16). "Data analysts remained blinded to allocation during the study by having access to only aggregate data and no access to data that could reveal treatment arm, such as course attendance". "Most of the outcome data were obtained from self-report questionnaires from participants who were not blind to treatment allocation". (p 16)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** Participants were analysed as randomised, and all were included in the primary analysis by imputation of missing data. **Quotes:** "We obtained robust variance estimates in all regression models to allow for the potential clustering effect of receiving therapy in groups in the PEPS arm." (p 8) "The primary analysis (ITT) compared the mean SFQ score be-

McMurran 2016 *(Continued)*

		tween PEPS and usual treatment at 72 weeks postrandomisation follow-up, adjusted for baseline SFQ score and stratification variables (centre and gender), and implemented using maximum likelihood-based generalised linear modelling." (p 12) "The pattern of missing data was investigated by examining variables recorded at baseline that were associated with 'missingness' of SFQ score at the 72-week follow-up. Multiple imputation and analysis of multiple imputed data sets were conducted using 'mi' procedures in Stata. The imputation model contained site, age, sex,ethnicity, social status, PD category (simple or complex), SFQ at baseline and 24 weeks, baseline EQ-5D health state score, baseline HADS score, baseline SPSI-R score and baseline three main problems score, and 20 data sets were imputed." (p 12)
Selective reporting (reporting bias)	Low risk	**Comment:** in terms of outcomes, protocol and full-text report matched.
Other bias	High risk	**Treatment adherence** **Comment:** adherence was self-rated by the therapist. **Attention bias** **Comment:** mean number of treatment weeks: TAU non-completer = 30 (SD = 25.7), completer = 80.2 (SD = 9,8); PEPS non-completer = 36.7 (SD = 23,4), completer = 80.3 (SD = 10.4). Seemed that both groups got equal amount of therapy. **Allegiance bias** **Comment:** authors (MM, CD) have allegiance to PEPS therapy. **Vested interest** **Comment:** The National Institute for Health Research (NIHR) Health Technology Assessment programme funded this study. Hywel Williams is the Deputy Director of this programme but was not involved in the funding decision for this programme.

Mehlum 2014

Study characteristics	
Methods	19-week trial with 2 arms 1. Dialectical behavior therapy for adolescents (DBT-A) 2. Enhanced usual care **Duration of trial:** 19 weeks **Country:** Norway **Setting:** outpatient
Participants	**Method of recruitment of participants:** recruited from child and adolescent psychiatric outpatient clinics in Oslo that screened newly referred patients for current self-harm. Comorbidity in BPD subsample (N = 14, 35.9% of overall sample) unclear **Inclusion criteria** 1. A history of at least 2 episodes of self-harm 2. At least 1 within the last 16 weeks

Mehlum 2014 *(Continued)*

3. At least 2 DSM-IV criteria for borderline personality disorder (+ the self-destructive criterion) or alternatively, at least 1 DSM-IV criterion for borderline personality disorder + at least 2 subthreshold-level criteria
4. Fluency in Norwegian

Exclusion criteria

1. Diagnosis of bipolar disorder (except bipolar II)
2. Schizophrenia
3. Schizoaffective disorder
4. Psychotic disorder not otherwise specified
5. Intellectual disability
6. Asperger syndrome

Interventions	**Experimental group** **Treatment name:** DBT-A **Number randomised to group:** 39 **Duration:** 19 weeks **Control/comparison group** **Comparison name:** enhanced usual care **Number randomised to group**: 38 **Duration:** 19 weeks **Both groups:** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** Overall sample at baseline (including sub-threshold BPD): "Three DBT-A patients (7.7%) used at least 1 psychotropic drug for a mean number of 94.7 days (SD ¼ 64.3), whereas 5 EUC patients (13.2%) used such medication for a mean number of 72.8 days (SD ¼ 16.6), with no significant differences." (p. 1087) Medication use in BPD subsample (N = 14, 35.9% of overall sample) unclear **Proportions of participants taking standing psychotropic medication during trial observation period:** Overall sample (subthreshold including): "Only 7 participants (4 in the DBT-A group and 3 in the EUC group) had used any psychotropic medication over the follow-up year (not significant)." (Mehlum 2016, p. 297) Medication use in BPD subsample unclear (N = 14, 35.9% of overall sample) unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Zanarini Rating Scale for Borderline Personality Disorder (Zan-BPD); Borderline Personality Disorder Severity Index, Fourth version (BPDSI-IV); Clinical Global Imperession Scale for Borderline Personality Disorder Patients (CGI-BPD); or Borderline Symptom List (BSL) 2. Self-harm, in terms of proportion of participants with self-harming behaviour, or as assessed by Deliberate Self-harm Inventory (DSHI); Self-harm Behavior Questionnaire; or Lifetime Parasuicide Count (LPC) 3. Suicide-related outcomes, assessed by the Suicidal Behaviours Questionnaire; Beck Scale for Suicidal Ideation, in terms of proportion of patients with suicidal act; or Suicidal Ideation Questionnaire – Junior

Mehlum 2014 *(Continued)*

4. Mental health status, assessed by the Global Assesment Scale; Global Assessment of Functioning Scale; or Social Functioning Questionnaire

Secondary

1. Anger, assessed by the hostility subscale of the Symptom Checklist-90-Revised (SCL-90-R) or the State-Trait Anger Expression Inventory
2. Affective instability, assessed by the relevant item on the Zan-BPD, CGI-BPD or BPDSI-IV
3. Chronic feelings of emptiness, assessed by the relevant item on the Zan-BPD, CGI-BPD or BPDSI-IV
4. Impulsivity, assessed by the Barrett Impulsiveness Scale, or the Anger, Irritability and Assault Questionnaire
5. Interpersonal problems, assessed by the Inventory of Interpersonal Problems, or the relevant item on the Zan-BPD, CGI-BPD, BPDSI-IV, or SCl-90-R
6. Abandonment, assessed by the relevant item on the Zan-BPD, CGI-BPD or BPDSI-IV
7. Identity disturbance, assessed by the relevant item on the Zan-BPD, CGI-BPD or BPDSI-IV
8. Dissociation and psychotic-like symptoms, assessed by the Dissociative Experience Scale or the Brief Psychiatric Rating Scale
9. Depression, assessed by the Beck Depression Inventory, the Montgomery Åsberg Depression Rating Scale or the short (13-item) version of the Self-report Mood and Feelings Questionnaire (SMFQ)
10. Attrition, in terms of patients lost after randomisation in each group
11. Adverse effects, measured by use of standardised psychometric rating scales, such as the Systematic Assessment for Treatment Emergent Events, laboratory values or spontaneous reporting

Notes

Sample size calculation: yes

Ethics approval: The study was approved by the Regional Committee for Medical Research Ethics, South-East Norway, and all patients and parents provided written informed consent.

Comments from review authors:

1. We contacted Dr Mehlum by email in 2017 about the possibility of getting access to subsample data on patients with borderline personality disorder and we were informed that they were working on new publications using the borderline personality disorder - data only.
2. Data extraction was based on a secondary publication of this study.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Treatment allocation of participants after baseline assessments was based on a permuted block randomization procedure with an undisclosed and variable blocking factor, and daily management of the randomization procedures was performed by an external group." (p 1083)
Allocation concealment (selection bias)	Low risk	**Quote:** "…and daily management of the randomization procedures was performed by an external group." (p 1083)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Diagnostic assessments were made by experienced clinicians blinded to treatment allocation." (p 1083)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quotes:** "Data analysis was by intention to treat."; "Although some patients dropped out of treatment, all patients were followed from baseline to trial completion with no dropouts from the research." **Comment:** All participants were assessed for outcome measures at follow-ups regardless of treatment exposure (see p 1086). Overall, no differences are seen in proportion of withdrawals between groups. The study measured follow-up outcome data on all participants regardless of amount of treatment exposure.

Mehlum 2014 *(Continued)*

		No information was given on how participants with less exposure were included/imputed in the final analyses.
Selective reporting (reporting bias)	Unclear risk	**Comment:** all outcomes listed in registration were reported on in final paper of the overall sample, including participants with subthreshold BPD. Additionally, hopelessness and BPD symptoms were reported, which had not been listed in the protocol. These were not described as post hoc analyses in the final report. For the sample included here (full-BPD), only some data were available for depression, suicidality and psychosocial functioning.
Other bias	High risk	**Treatment adherence** **Quote:** "adherence to DBT continued to be assessed throughout the trial". Adherence controlling was conducted for the DBT group. Unclear if it was done for the control group **Attention bias** **Quotes:** "Dialectical Behavior Therapy, delivered for 19 weeks, consisted of 1 weekly session of individual therapy (60 minutes), 1 weekly session of multifamily skills training (120 minutes), and family therapy sessions and telephone coaching with individual therapists outside therapy sessions as needed." "Enhanced usual care was 19 weeks of standard care (enhanced for the purpose of the study by requiring that EUC therapists agree to provide on average no less than 1 weekly treatment session per patient throughout the trial)". (p 1084) **Comment:** more attention spent on DBT group **Allegiance bias** **Comment:** first author (L Mehlum) is educated in DBT-therapy (www.med.uio.no/klinmed/personer/vit/lmehlum). Mehlum is one of the most prominent DBT people in Norway, and may have edited a handbook of DBT or received money for educating others in DBT.

Mohamadizadeh 2017

Study characteristics	
Methods	16 sessions trial with 3 arms 1. Dialectical behavior therapy (DBT) 2. Schema therapy (ST) 3. Control (no intervention) **Duration of trial:** 16 sessions **Country:** Iran **Setting:** inpatient
Participants	**Method of recruitment of participants**: convenience sampling method **Sample size:** 36 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age**: not stated **Sex:** 100% female

Mohamadizadeh 2017 *(Continued)*

Comorbidity: not stated

Inclusion criteria: not stated

Exclusion criteria

1. Patients with previous suicide attempt or recurrent suicidal behaviour
2. People with perturbations, such as bipolar disorder, substance abuse and personality disorder, treated with the drug were initially excluded.

Interventions	**Experimental group 1** **Treatment name:** DBT **Number randomised to group:** 12 **Duration:** 16 sessions for 90 minutes **Experimental group 2** **Comparison name:** ST **Number randomised to group:** 12 **Duration:** 16 sessions for 90 minutes **Control/comparison group** **Comparison name:** no treatment **Number randomised to group:** 12 **Duration:** 16 sessions for 90 minutes **Both groups** **Concomitant psychotherapy:** none **Concomitant pharmacotherapy:** none; "The use of any psychiatric medication during training, from the very first session of treatment, and the use of any type of psychological services were abandoned." (quote, p 1027) **Proportions of participants taking standing psychotropic medication during trial observation period:** equal (medication not allowed)
Outcomes	**Primary** 1. Suicide-related outcomes, assessed by the Beck Scale for Suicidal Ideation, suicidal thoughts subscale (BSS) **Secondary** 1. Depression, assessed by the Beck Depression Inventory (BDI)
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** insufficient information. It was unclear if the no treatment control group were randomized or not
Allocation concealment (selection bias)	Unclear risk	**Comment:** insufficient information
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** insufficient information

Mohamadizadeh 2017 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no attrition rates reported; no imputation methods reported
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol found, so we could not compare planned methods with reported methods
Other bias	Unclear risk	**Adherence to treatment** **Comment:** no adherence check stated, but a list over each session was provided **Attention bias** **Comment:** no differences between groups **Allegiance bias** **Comment:** none

Morey 2010

Study characteristics	
Methods	1.5 month trial with 2 arms 1. Manual Assisted Cognitive Therapy (MACT) + Therapeutic Assessment (TA) 2. Manual Assisted Cognitive Therapy (MACT) **Duration of trial**: 1.5 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Samplse size:** 16 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV), and Personality Assessment Inventory-Borderline Scale (PAI-BOR) **Mean age:** 31.1 years **Sex:** 81.3% female **Comorbidity:** not specified **Inclusion criteria** 1. Scores above N70 on Personality Assessment Inventory-Borderline Scale (PAI BOR) and SUI 2. Scores of 5 or more on the PDQ-4 borderline personality disorder 3. Scores above 70 on the SPS total 4. Scores above 5 symptoms of borderline personality disorder on the DIPD-IV **Exclusion criteria** 1. Active psychosis

Morey 2010 *(Continued)*

	2. History of schizophrenia 3. Substance intoxication or withdrawal
Interventions	**Experimental group** **Treatment name:** MACT + TA **Number randomised to group:** 16 **Duration:** 1.5 months (6 weekly sessions) **Control/comparison group** **Comparison name:** MACT **Number randomised to group:** 16 **Duration:** 1.5 months (6 weekly sessions) **Both groups** **Concomitant psychotherapy:** No other psychosocial interventions were allowed. **Concomitant pharmacotherapy:** Psychotropic medication was allowed. 56% of participants were taking psychotropic medication at baseline. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. BPD severity, assessed with the PAI-BOR 2. Suicidality, assessed with the PAI-BOR 3. Parasuicidality, assessed with the PAI-BOR **Secondary** 1. Affective instability, assessed with the PAI-BOR 2. Interpersonal problems, assessed with the PAI-BOR 3. Identity disturbance, assessed with the PAI-BOR
Notes	**Sample size calculation:** yes **Ethics approval:** not stated **Comments from the review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** study stated that participants were randomised but the specific methods were not clear.
Allocation concealment (selection bias)	Unclear risk	**Comment:** study stated that participnats were randomised but the specific methods were not clear.
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Quote:** "[...] assessments [...] were conducted by an independent evaluator". (p 533)

Morey 2010 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no further details
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting, but insufficient information to permit judgement of 'high' or 'low' risk of bias
Other bias	Low risk	**Adherence bias** **Quote:** "Consenting clients in both conditions were assigned to a project therapist, who worked under the supervision of the primary investigator." (p 532) **Allegiance bias** **Quote:** study authors not among treatment developers **Attention bias** **Quote:** both groups received comparable amounts of attention.

Morton 2012

Study characteristics	
Methods	13-week trial with 2 arms 1. Acceptance and commitment therapy (ACT) + treatment-as-usual (TAU) 2. TAU **Duration of trial:** 13 weeks of therapy **Country:** Australia **Setting:** outpatient, within public-sector mental health services, Victoria
Participants	**Method of recruitment of participants:** potential participants recruited via referrals from public mental health services to Spectrum (personality disorder service for Victoria) **Sample size:** 41 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I), and Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** ACT + TAU = 35.6 years (standard deviation = 9.33, range = 19–52), TAU = 34.0 years (standard deviation = 9.02, range = 21–54) **Sex:** 90.5-95% female **Comorbidity:** not stated **Inclusion criteria** 1. 4 or more criteria of borderline personality disorder 2. A registered client of a public sector adult mental health service 3. Agreement from the public sector service to arrange an inpatient admission or crisis team visit, if required 4. Any kind of regular contact (at least once in 2 weeks) with a public or private sector clinician, not necessarily for therapy

Morton 2012 *(Continued)*

	Exclusion criteria 1. Current positive or negative psychotic symptoms other than reactive psychotic symptoms associated with borderline personality disorder 2. A significant risk of violent or threatening behavior, or both, to other participants 3. Intellectual disability, cognitive impairment, or difficulty speaking English, severe enough to interfere with participation
Interventions	**Experimental group** **Treatment name:** ACT + TAU **Number randomised to group:** 21 **Duration:** 26 weeks **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 20 **Duration:** also appears to be 26 weeks **Both groups** **Concomitant psychotherapy:** 11 participants (27% of the total sample population of 41) described the service they received as therapy or counselling, rather than case management or medication review. **Concomitant pharmacotherapy:** TAU offered medications management. **Proportions of participants taking standing psychotropic medication during trial observation period:** no data provided specifying medication use in the two groups
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Borderline Evaluation of Severity over Time (BEST) **Secondary** 1. Affective instability, assessed by the Difficulties in Emotion Regulation Scale (DERS) 2. Depression, assessed by the Depression anxiety Stress Scale (DASS) 3. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** 1. Information about randomisation and allocation procedure, as well as about blinding of outcome assessors and about protocol registration, was recived by email from Dr Morton on 22 December 2017.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quotes:** "Available participants at each location were randomized to ACT + TAU or TAU, after stratification of the sample based on the presence or absence of two or more self-harm episodes in the last year. This stratification of the sample was done in order to ensure equal base rates across the conditions, as recent self-harm was not a criterion of inclusion in the trial. This resulted in four ACT groups in four locations, each with 4 to 6 participants". The randomization process was planned as follows and was carried out as described: “Randomisation to immediate treatment or waiting list control: When 16 clients with four or more of the criteria for BPD, assessed as suitable, have been recruited for a group at a particular location, a randomisation procedure will be carried out and eight clients will commence treatment as soon as practicable with the remaining eight commencing three months later (waiting list control

Morton 2012 *(Continued)*

		group). If this procedure would result in an unreasonable delay, a group may commence when 10 clients have been recruited (five will be randomised to an immediate start and five to waiting list). Recruitment will continue for nine months or until 60 clients have been accepted into phase 1 groups whichever occurs sooner. The immediate treatment clients will have a three month period of follow up before phase 2 groups begin. Because change in self-harm is of interest and yet only about half the sample are expected to be still currently self-harming, the sample will be stratified based on the presence or absence of two or more self-harm episodes in the last year. The randomisation procedure will use a randomisation in blocks of four procedure (Pocock, 1983), using resources available at randomization.com. It will be carried out by an independent person who is not part of the research or clinical team." (personal communication)
Allocation concealment (selection bias)	High risk	**Quote:** "Investigators were not blind to group allocation." (personal communication)
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "Outcomes were assessed via self-report questionnaires. Outcome assessors were not blind". (personal communication)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Quote:** "Scores were analyzed using mixed model procedures, which allowed for all available data to be used in the analyses. This approach takes into account the obtained outcomes and missingness for participants with missing data, somewhat reducing the analytic problem presented by missing data. Compound symmetry covariance matrices were used as they were found to provide better model fit with fewer parameters than unstructured matrices as determined by the restricted log likelihood". (p 537)
Selective reporting (reporting bias)	Unclear risk	**Quote:** "The group protocol was developed based on 10 years of experience in providing residential and outpatient treatment for people with a diagnosis of BPD". (p 528)
Other bias	High risk	**Treatment adherence** **Comment:** clinicians were instructed not to include any CBT change strategies such as cognitive challenge. Efforts were made to ensure treatment fidelity via review of group materials by ACT trainer Russ Harris and via consultation and supervision sessions, which included discussion framed by the ACT Competencies. **Allegiance bias** **Quote:** "An outline of the 12 sessions (of ACT) is provided in Table 2. A copy of the treatment manual, including the handouts and group session outlines) is available from Spectrum." (p 534) **Comment:** Morton (lead author) developed the treatment manual used in the experimental group **.Attention bias** **Comment:** ACT consisted of 12 2-hour sessions. Unclear how the treatment exposure in TAU compared to this

Nadort 2009

Study characteristics

Nadort 2009 *(Continued)*

Methods	18-month trial with two arms 1. Schema-focused therapy 2. Schema-focused therapy + therapist telephone availability outside office hours in case of crisis (SFT + TTA) **Duration of trial:** 18 months **Country:** The Netherlands **Setting:** outpatient
Participants	**Methods of recruitment of participants:** Most of the patients were referred by therapists in secondary and tertiary community mental health institutes, some patients were referred by primary care physicians of psychotherapists with private practices. All patients were referred based on a clinical diagnosis of BPD. Patients were then assessed at each study site. **Sample size:** 62 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and Borderline Personality Disorder Severity Index - Version IV (BPDSI-IV) score > 20 **Mean age:** 32.0 years **Sex:** 96.8% female **Comorbidity:** not specified **Inclusion criteria** 1. DSM-IV-based main diagnosis of BPD 2. Age between 18 and 60 years 3. BPSDI-IV score of 20 or higher 4. Dutch literacy **Exclusion criteria** 1. Diagnosis of borderline personality disorder not main diagnosis 2. Psychotic disorders (except short, reactive psychotic episodes) 3. Bipolar disorder 4. Dissociative identity disorder 5. Antisocial personality disorder 6. Attention-deficit/hyperactivity disorder 7. Addiction of such severity that clinical detoxification was indicated (after which entering treatment was possible) 8. Psychiatric disorders secondary to medical conditions 9. Mental retardation 10. No Dutch literacy
Interventions	**Experimental group** **Treatment name:** schema-focused therapy (SFT) **Number randomised to group:** N = 30 **Duration:** 18 months (45-minute individual sessions twice a week for 12 months, one weekly session in the second year)

Nadort 2009 *(Continued)*

	Control/comparison group **Comparison name:** schema-focused therapy + therapist telephone availability outside office hours in case of crisis (SFT + TTA) (45-minute individual sessions twice a week for 12 months, one weekly session in the second year) **Number randomised to group:** N = 30 **Duration:** 18 months **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** medication use allowed. 58% of patients used psychotropic medication at baseline. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline severity, assessed by Borderline Personality Disorder Severity Index (Version IV) (BPDSI-IV)
Notes	**Sample size calculation:** yes **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** no clear information provided on method of randomisation
Allocation concealment (selection bias)	Low risk	**Quote:** "we used a stratified randomization procedure. The stratification procedure was performed by a study-independent person and concealed for participating therapists, patients and researchers." (p 962)
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Quotes:** "Study researchers, screeners, research assistants and therapists were masked to treatment allocation during the screening period and the first assessment." (p 963) "A limitation of the present study is that the assessments will be performed by research assistants who cannot remain blinded to the treatment condition of the included patients, as is always the case in trials studying the effects of psychotherapy. Nor are the patients blind to treatment condition. In this study, however, added to the main interview-based outcome measures, self-report questionnaires will be administered, that will not be influenced by the research assistants." (p 71)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no clear details on attrition provided
Selective reporting (reporting bias)	Low risk	**Comment:** published protocol is available (Nadort 2009), with no indication of selective reporting in the full report.
Other bias	Unclear risk	**Comment:** no clear details provided

Pascual 2015

Study characteristics	
Methods	16-week trial with 2 arms 1. Cognitive rehabilitation (CR) 2. Psychoeducation (PE) **Duration of trial:** 16 weeks **Country:** Spain **Setting:** outpatient
Participants	**Method of recruitment of participants:** not stated **Sample size:** 70 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and Revised Diagnostic Interview for Borderlines (DIB-R) **Mean age:** CR = 32.4 years (standard deviation = 6.04), PE = 32.8 years (standard deviation = 8.8) **Sex:** 74.3% female **Comorbidity:** No information **Inclusion criteria** 1. Outpatients aged 18-45 years 2. Diagnoses of borderline personality disorder according to DSM-IV-TR criteria and evaluated by 2 semi-structured clinical interviews - SCID-II and the DIB-R - to guarantee a correct diagnosis 3. Clinical severity measured with Clinical Global Impression for BPD (CGI- BPD) higher than 4 4. Functional impairment measured with a Global Assessment Functioning (GAF) lower than 65 **Exclusion criteria** 1. Severe physical conditions, such as organic brain syndrome or neurological disease that could affect neuropsychological performance 2. Intelligence quotient below 85 3. Major depression disorder (MDD) or substance misuse within the last 6 months evaluated with DSM-IV-TR criteria and SCID-I specific sections 4. DSM-IV-TR criteria for schizophrenia, severe psychotic disorder or bipolar disorder evaluated by SCID-I specific sections 5. Previous participation in any psychoeducation or cognitive rehabilitation intervention
Interventions	**Experimental group** **Treatment name:** cognitive rehabilitation (CR) **Number randomised to group:** 36 **Duration:** 16 weeks **Control/comparison group** **Comparison name**: psychoeducation (PE) **Number randomised to group:** 34 **Duration:** 16 weeks **Both groups** **Concomitant psychotherapy:** no **Concomitant pharmacother**apy: All patients continued pharmacological treatment if it had been initiated prior to inclusion. At baseline, 75% of the CR group was taking psychotropic medications, and 67.6% of the PE group. The difference was not significant.

Pascual 2015 *(Continued)*

	Proportions of participants taking standing psychotropic medication during trial observation period: unclear
Outcomes	**Primary** 1. BPD severity, assessed by Borderline Symptom List – 23 (BSL-23) **Secondary** 1. Impulsivity, assessed by the Barrett Impulsiveness Scale (BIS) 2. Depression, assessed bythe Beck Depression Inventory (BDI) or the Montgomery Åsberg Depression Rating Scale 3. Attrition, in terms of patients lost after randomisation in each group 4. Adverse events (final results not reported)
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "All participants were randomized to receive CR or PE in a 1:1 ratio stratified by centre, age, and education level. Generation of random allocation sequence was done with the Research Randomizer (www.randomizer.org)". (p 2)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information provided about whether or not allocation was concealed
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "Study design was a multicenter, randomized, rater-blind clinical trial". (p 2)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** reasons for dropout fairly balanced between groups. No differences in overall attrition rates between groups, but the attrition rates exceeded the 30% estimate of the power calculation, which may have increased uncertainty in the overall effect estimates.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no secondary outcomes were included in the trial registration, but they were in the published paper. The paper did not categorise them as post hoc analyses.
Other bias	High risk	**Treatment adherence** **Quote:** "To ensure the reliability among centers regarding the evaluation and the treatment fidelity, two meetings were organized before the start of the study to train therapists". (p 2) **Allegiance bias:** **Comment:** Google search on first and last author did not reveal any allegiance biases. **Attention bias:** **Comment:** CR: group sessions, 120 minutes, twice a week during 16 weeks (32 sessions) PE: 16 weekly group sessions of 120 minutes each (16 sessions)

Philips 2018

Study characteristics	
Methods	15.5-18 month trial with 2 arms 1. Mentalisation-based therapy (MBT) 2. Treatment-as-usual (TAU) **Duration of trial:** 18 months **Country:** Sweden **Setting:** Stockholm Centre for Dependency Disorders
Participants	**Method of recruitment of participants**: "Patients were recruited through outpatient addiction treatment services throughout Stockholm County, through case-finding among the social service offices in the region and through advertising in newspapers." (quote, p 3) **Sample size:** 46 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 36.7 years (standard devtiation = 9.6, range = 20-54) **Sex:** 80.4% female **Comorbidity:** Current axis I disorders (overall sample, not specified by treatment groups): MDD 28.3%, other depressive disorder including dysthymia 28.3%, bipolar II disorder 6.5%, PTSD 15.2%, any anxiety disorder excluding PTSD 65.2%, any eating disorder 6.5%, somatoform disorder 2.2%, any psychotic disorder 0% Current axis I substance use disorder (overall sample): alcohol 45.7%, amphetamines 13.0%, cannabis 6.5%, opioids 39.1%, sedatives, hypnotics, anxiolytics 21.7% **Inclusion criteria** 1. DSM-IV diagnosis of borderline personality disorder and substance dependence 2. Males and females aged 18-65 3. Currently under treatment at substance dependence treatment clinic **Exclusion criteria** 1. Schizophrenia, schizoaffective disorder, bipolar disorder type I, cognitive impairment (including mild cognitive impairment: IQ below 85), autism spectrum disorders, psychopathy 2. Participation in psychotherapy outside of the study (ongoing or terminated less than 90 days before inclusion) 3. Not being able to communicate in the Swedish language without an interpreter
Interventions	**Experimental group** **Treatment name:** mentalisation-based therapy (MBT) **Number randomised to group:** 24 **Duration:** mean = 15.5 months (mean = 63.3 sessions) **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** not stated **Control/comparison group** **Comparison name:** treatment-as-usual (TAU) **Number randomised to group:** 22 **Duration:** 18 months (mean = 10.7 therapy sessions)

Philips 2018 *(Continued)*

	Concomitant psychotherapy: of the patients randomised to TAU (n = 22), 11 received some sort of psychotherapy **Concomitant pharmacotherapy:** not stated **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Borderline Personality Disorder Severity Index, Fourth version (BPDSI-IV) 2. Self-harm, assessed by the Deliberate Self-harm Inventory (DSHI) 3. Suicide-related outcomes, by means of suicide attempts, assessed from direct contact with patients and health care staff and from reviewing case records 4. Mental health status, assessed by the Global Symptom Index (GSI) **Secondary** 1. Interpersonal problems, assessed by the Inventory of Interpersonal Problems - Shortened Version (IIP) 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** yes **Ethics approval:** Stockholm Regional Ethical Review Board (registration number: 2007/642-31/1) **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "The randomization was conducted by the KTA [Karolinska Trial Alliance] using an urn procedure. The randomization was made in blocks and the researchers were not informed of the block size. KTA prepared sealed randomization envelopes with information about each patient's treatment assignment." (p 3)
Allocation concealment (selection bias)	Low risk	**Quote:** "The randomization was conducted by the KTA [Karolinska Trial Alliance] using an urn procedure. The randomization was made in blocks and the researchers were not informed of the block size. KTA prepared sealed randomization envelopes with information about each patient's treatment assignment." (p 3)
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no information on blinding provided by report authors
Incomplete outcome data (attrition bias) All outcomes	High risk	**Quotes:** "Outcome analyses were made both in the form of completer analyses and ITT analysis with the last observation carried forward. Throughout all measures, completer and ITT analyses gave equivalent results and therefore only the results from completer analyses are described here (Table 2). Outcome analyses of the self-report and interview measures were seriously challenged by the high attrition rates, as only 24 out of 46 patients came to the measurements at endpoint 18 months (13 out of 24 patients in MBT, and 11 out of 22 patients in the control group)." (p 5) "Due to the recruitment problems in the project, our initial power calculation had to be revised." (p 4)
Selective reporting (reporting bias)	High risk	**Comment:** Beck's Suicidal Intent Scale, Social Adjustment Scale – Self Report listed as secondary outcomes in trial registration, but not in final report. Out-

Philips 2018 *(Continued)*

		comes related to health economics and criminality also listed in registration, but not in full report
Other bias	High risk	**Adherence bias** **Quote:** "Despite significant efforts to train therapists in the MBT model, most of the them had poor average results on the MDT adherence tests: only 2 therapists passed the threshold for adequate MBT, while the remaining 7 failed to do so." (p 6) **Attention bias** **Quote:** "For patients randomized to MBT (n = 24), the treatment duration was in average 15.5 months (SD 4.1, range 3–18) with a mean of 63.3 MBT sessions (SD 26.7, range 10–116). Control group patients received on average 10.7 therapy sessions (SD 14.7, range 0–45)". (p 5) **Allegiance bias** **Comment:** none found

Priebe 2012

Study characteristics	
Methods	12-month trial with 2 arms 1. Dialectical behavior therapy (DBT) 2. Treatment-as-usual (TAU) **Duration of trial:** 12 months **Country:** UK **Setting:** outpatient
Participants	**Method of recruitment of participants**: referral **Sample size:** 70 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 32.2 years (standard deviation = 10.8) **Sex:** 87.5% female **Comorbidity**: yes, but not specified. Number of axis 1 disorders = 8 **Inclusion criteria** 1. 5 days or more with self-harm in the year prior to treatment 2. Aged 16 years or over 3. Diagnosis of at least 1 personality disorder **Exclusion criteria** 1. Severe learning difficulties that would interfere with the individual's ability to participate in Dialectical behaviour therapy (DBT) treatment 2. An inability to read or write English

Priebe 2012 *(Continued)*

Interventions	**Experimental group** **Treatment name:** dialectical behaviour therapy (DBT) **Number randomised to group:** 40 **Duration:** 12 months **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** not stated **Control/comparison group** **Comparison name:** treatment-as-usual **Number randomised to group:** 40 **Duration:** 12 months **Concomitant psychotherapy:** TAU encompasses many different psychotherapies. It is not specified what treatments participants in this group received. **Concomitant pharmacotherapy:** allowed (utilisation was monitored), no further data **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. BPD severity, assessed by the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD) 2. Self-harm, in terms of proportion of participants with self-harming behaviour 3. Mental health status, assessed by the 24-item Brief Psychiatric Rating Scale (BPRS) **Secondary** 1. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** not stated **Ethics approval:** yes **Comments from review authors:** 1. We contacted Dr Priebe by email on 26 May 2016 asking for the number of BPD participants in the study sample. We received this answer: "Indeed the precise diagnoses are not reported in the paper, but my memory says that 79 patients out of 80 did have a BPD diagnosis. I guess no separate analysis is needed in this case.". We also received some additional data on self-harm from Dr Priebe.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** “Randomisation was computer generated with a 1:1 allocation by an independent statistician, using 6 blocks of 12 randomly permuted treatment allocation sequences, with a final block of 8.” (p 358)
Allocation concealment (selection bias)	Low risk	**Quote:** “Randomisation was computer generated with a 1:1 allocation by an independent statistician, using 6 blocks of 12 randomly permuted treatment allocation sequences, with a final block of 8.” (p 358)
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Quote:** “Interviewers were therefore not masked to treatment allocation.” (p 358)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Quote:** “Of the 40 randomised to receive DBT, 3 people did not start treatment due to various reasons and a further 18 patients did not complete the 1-year treatment”. (p 359)

Priebe 2012 *(Continued)*

Selective reporting (reporting bias)	Unclear risk	**Comment:** The trial registration listed quality of the therapeutic relationship as an outcome measure; however, this measure was not mentioned in the final report.
Other bias	Unclear risk	**Treatment adherence** **Comment:** "To establish adherence to the DBT model, individual treatment sessions were audio recorded and 10% of the available recordings were assessed for adherence by a DBT therapist [...] using a 63-item rating scale". (p 357) Adherence routines for DBT. No mentioning of adherence routines for TAU **Allegiance bias** **Comment:** first author is a licensed psychotherapist. Unclear if he has direct interest in DBT **Attention bias** **Comment:** few data on what encompassed TAU – large heterogeneity - and therefore, it may be possible that the participants in the DBT group received more therapy. **Vested interest** **Comment:** the authors declared that they have no conflicts of interest.

Reneses 2013

Study characteristics	
Methods	20-24 week trial with 3 arms 1. Psychic Representation focused Psychotherapy (PRFP) + conventional treatment 2. Conventional treatment **Duration of trial:** 20-24 weeks **Country:** Spain **Setting:** outpatient
Participants	**Method of recruitment of participants:** patients of San Carlos and Hospital Universitario 12 de Octubre of Madrid included in study. The patients were recruited consecutively over a 12-month period. **Sample size:** 53 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 33.8 years (standard deviation = 7.5) **Sex:** 70.5% female **Comorbidity:** 47.7% with axis 1 **Inclusion criteria** 1. Clinical diagnosis of borderline personality disorder following the DSM-IV-TR criterion made by the treating psychiatrist during the selection phase and using the SCID-II interview in the inclusion phases 2. Aged 18 to 50 years 3. Having a clinical situation of outpatient treatment and having accepted the study conditions by informed consent

Reneses 2013 *(Continued)*

	Exclusion criteria 1. Having active suicide risk symptoms, violent or unmanageable heteroaggressive behaviors on the outpatient level at the time of recruitment 2. Comorbidity with diagnosis of eating behavior disorder on Axis I, with toxic dependence disorder or current severe physical disease
Interventions	**Experimental group** **Treatment name:** psychic representation focused psychotherapy (PRFP) + conventional treatment **Number randomised to group:** 25 **Duration:** 20 weeks **Control/comparison group** **Comparison name:** conventional treatment (pharmacological treatment and psychological advice) **Number randomised to group:** 28 **Duration:** 24 weeks **Both groups** **Concomitant psychotherapy:** optionally, patients could receive nonstandard outpatient psychological advice, but any type of standard psychotherapy excluded **Concomitant pharmacotherapy:** all participants were receiving drug treatment, 90% of whom were receiving antidepressants, more than 40% mood stabilisers and 30% antipsychotics.
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Zanarini Rating Scale for Borderline Personality Disorder, total score (Zan-BPD) 2. Suicide-related outcomes, assessed by the suicidality subscale of the ZAN-BPD 3. Psychosocial functioning, assessed by the Social Adaptation Self-evaluation Scale (SASS) **Secondary** 1. Affective instability, assessed by the affective instability subscale of the ZAN-BPD 2. Chronic feelings of emptiness, assessed by the feeling of emptiness subscale of the ZAN-BPD 3. Impulsivity, assessed by the impulsivity subscale of the ZAN-BPD 4. Interpersonal problems, assessed by the relations subscale of the ZAN-BPD 5. Identity disturbance, assessed by the identity subscale of the ZAN-BPD 6. Depression, assessed by the Montgomery Åsberg Depression Rating Scale (MADRS) 7. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** not reported **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "The subjects who met the inclusion criteria were assigned to one of the two intervention groups through the generation of simple random sampling through a sequence of randomized numbers generated with EPIDAT 3.1." (p 141)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information on allocation concealment was provided by the authors
Blinding of outcome assessment (detection bias)	Unclear risk	**Comment:** the authors did not mention whether or not outcome assessors were blinded

Reneses 2013 *(Continued)*
All outcomes

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** high attrition rates. Data were imputed with the LOCF, which is potentially inappropriate. Dropout reasons of lack of satisfaction were over-represented in control group relative to EG
Selective reporting (reporting bias)	Unclear risk	**Comment:** we could not find a published protocol so could not provide a clear judgement of 'high' or 'low' risk of bias
Other bias	High risk	**Treatment adherence** **Comment:** adherence routines for EG, no information on CG **Quote:** "The supervision method consisted in random control by the external supervisor of the project of five sessions of each psychotherapist." (p 141) **Allegiance bias** **Comment:** time-limited, manualised PDT developed by the research group. **Attention bias** **Comment:** EG received 20 weeks of treatment, whereas CG received 24 weeks

Robinson 2016

Study characteristics	
Methods	1-year trial with 2 arms 1. Mentalisation-based treatment for eating disorders (MBT-ED) 2. Specialist supportive clinical management for eating disorders (SSCM-ED) **Duration of trial:** 1 year **Country:** UK **Setting:** outpatient
Participants	**Method of recruitment of participants:** participants recruited from clinical centres by referral from doctors working in the outpatient services of each centre. Referrals received by trial manager, who contacted the potential participant and provided the participant information sheet. **Sample size:** 68 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 31.1 years (standard deviation = 9.9) **Sex:** 92.7% female **Comorbidity:** anorexia = 5.9%, bulimia = 63.2%, binge eating disorder = 2.9%, eating disorder not otherwise specified (EDNOS) = 27.9% **Inclusion criteria** 1. Aged 18 years or older 2. Had a DSM-IV diagnosis of an eating disorder 3. Fulfilled either DSM-IV criteria for borderline personality disorder or had borderline personality disorder symptoms. The criteria for borderline personality disorder symptoms were both of the behavioural criteria of DSM-IV. 4. Impulsivity in at least 2 areas that are potentially self-damaging (e.g. spending, sexual behaviour, substance abuse, reckless driving, binge eating)

Robinson 2016 *(Continued)*

5. Recurrent suicidal behaviour or self-mutilating behaviour

Exclusion criteria

1. Current psychosis based on the Mini International Neuropsychiatric Schedule (MINI) examination
2. Current inpatient or day-patient (attending 3 or more days per week)
3. Currently in individual or group psychological therapy
4. Received MBT less than 6 months prior to randomisation
5. Organic brain disease leading to significant cognitive impairment or body mass index (BMI) less than 15 kg/m^2 (normal range = 18.5–25)

Interventions	**Experimental group** **Treatment name:** mentalisation-based treatment for eating-disorders (MBT-ED) **Number randomised to group:** 34 **Duration:** 1 year **Control/comparison group** **Comparison name:** specialist supportive clinical management for eating disorders (SSCM-ED) **Number randomised to group:** 34 **Duration:** 1 year **Both groups** **Concomitant psychotherapy:** no (excluded if currently in individual or group psychological therapy) **Concomitant pharmacotherapy:** not stated **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD) 2. Mental health status, assessed by the Global Assessment of Functioning Scale (GAF) **Secondary** 1. Affective instability, assessed by the relevant item or subscale on the ZAN-BPD 2. Chronic feelings of emptiness, assessed by the relevant item or subscale on the ZAN-BPD 3. Impulsivity, assessed by the relevant item or subscale on the ZAN-BPD 4. Interpersonal problems, assessed by the relevant item or subscale on the ZAN-BPD 5. Abandonment, assessed by the relevant item or subscale on the ZAN-BPD 6. Identity disturbance, assessed by the relevant item or subscale on the ZAN-BPD 7. Depression, assessed by The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) 8. Attrition, in terms of patients lost after randomisation in each group 9. Adverse effects, measured by spontaneous reporting
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** 1. We received additional subsample data on BPD patients only at two time points by email from Dr Hellier on 3 January and 27 March 2018.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "The method of randomisation of participants was block randomisation stratified by BMI (15.0–18.5, 18.6–24.9, 25)." (p 552)

Robinson 2016 *(Continued)*

Allocation concealment (selection bias)	Unclear risk	**Quote:** "Randomly varying block sizes were implemented in order to maintain pre randomisation allocation concealment. The trial manager used the randomisation result to allocate participants to a treatment." (p 552)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "single-blind (researchers and statisticians are blind)", "the trial statistician and research workers responsible for the collection of the assessments remained blind to treatment allocation during the trial and primary analyses." (p 550)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** 15/35 in SSCM-ED and 5/34 in MBT-ED did not receive interventions – significant differences. Reasons were similar across groups. 41/61 participants were included in the analyses, so this can be said to be a partial ITT analysis. Did not comply with the level of attendance calculated a priori. **Quotes:** "Participants allocated to SSCM-ED were significantly more likely to drop out before the start of therapy than those allocated to MBT-ED." (p 15) "We set a level of 50% attendance [10] to indicate compliance. That level was achieved by 47.1 % in the MBT- ED arm and 37.1% in the SSCM- ED arm". (p 556)
Selective reporting (reporting bias)	Low risk	**Quote:** "Not all questionnaires and interviews anticipated in the protocol were included in this analysis. Some were excluded because the small numbers remaining at follow-up did not justify statistical analysis of outcome over time, and others (the Object Relations Inventory (ORI), treatment adherence, Reading the Mind in the Eyes test and the Reflective Uncelar – they do not use all but it makes sense in statistical terms. Functioning Questionnaire (RFQ)) will be de-scribed elsewhere". (p 563)
Other bias	High risk	**Adherence bias** **Quotes:** "Adherence to the treatment model was tested by the supervisors. After the trial, seven recorded and transcribed sessions each of MBT-ED (individual therapy, four therapists) and SSCM-ED (seven therapists) were randomly selected and subjected to adherence rating." (p 552) "The adherence scores (with number of sessions scoring that level in brackets) were 7 (1), 6 (3), 4 (3). Competence scores were identical to adherence scores". (p 552) **Allegiance bias** **Comment:** trial was conducted with support from A Bateman **Attention bias** **Comment:** total number of hours in MBT-ED was 102.7 hours over 12 months; total number of hours in SSCM- ED was 20-26 hours over 12 months.

Rossouw 2012b

Study characteristics	
Methods	12-month trial with 2 arms 1. Mentalisation-based therapy for adolescents (MBT-A) 2. Treatment-as-usual (TAU) **Duration of trial:** 12 months **Country:** UK

Rossouw 2012b *(Continued)*

	Setting: mental health services
Participants	**Method of recruitment of participants**: from consecutive case individuals presenting with self-harm to community mental health services or acute hospital emergency rooms **Sample size:** 80 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Childhood Interview for DSM-IV Borderline Personality Disorder (CI-BPD) **Mean age:** MBT-A = 15.4 years (standard deviation = 1.3), TAU = 14.8 years (standard deviation = 1.2) **Sex:** 85% female **Comorbidity:** MBT-A: 30 had borderline personality disorder, TAU = 28 had borderline personality disorder. For the entire sample, 20 had alcohol problems in the MBT-A group and 15 in TAU, 13 had substance misuse in the MBT-A group and 9 in TAU, 39 had depression in the MBT-A group and 38 in TAU **Inclusion criteria** 1. Aged 12-17 years 2. Presented with at least 1 episode of confirmed self-harm within the past month and for whom self-harm was the primary reason for referral and was confirmed intentional **Exclusion criteria** 1. Psychosis 2. Severe learning disabiliy (IQ below 65) 3. Pervasive developmental disorder 4. Eating disorder in the absence of self-harm 5. Chemical dependence
Interventions	**Experimental group** **Treatment name:** mentalisation-based therapy for adolescents (MBT-A) **Number randomised to group:** 40 **Duration:** 12 months **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** Participants who were severely depressed were likely to be offered antidepressants; 16 (40%) received medication during the trial. **Control/comparison group** **Comparison name:** treatment-as-usual (TAU) **Number randomised to group:** 40 **Duration:** 12 months **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** 40% of the MBT-A group and 43% of the TAU group received medication at baseline. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the Childhood Interview for DSM-IV Borderline Personality Disorder (CI-BPD) 2. Self-harm, assessed by the self-harm subscale of the Risk-Taking and Self-Harm Inventory (RTSHI) **Secondary** 1. Interpersonal problems assessed by the Experiences in Close Relationships Scale – Avoidance and Anxiety subscales (ECR) 2. Depression, assessed by the Mood and Feelings Questionnaire (MFQ) 3. Attrition, in terms of patients lost after randomisation in each group

Rossouw 2012b *(Continued)*

Notes	**Sample size calculation:** yes **Ethics approval:** The study was approved by the North East London NHS Foundation Trust Institutional Review Board, REC 3. **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** eligible consenting participants were randomised by an independent statistician working off-site using an adaptive minimisation algorithm
Allocation concealment (selection bias)	Low risk	**Comment:** allocations were sent in separate envelopes to an administrator who informed the relevant clinicians
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** assessors and participants were both blinded to treatment assignment
Incomplete outcome data (attrition bias) All outcomes	High risk	**Comment:** ITT analyses were conducted. Only 37 out of 80 randomised participants completed therapy
Selective reporting (reporting bias)	High risk	**Comment:** there were several outcomes in the protocol that were not mentioned in the publication (Millon Adolescent Clinical Inventory, the Reading the Mind in the Eyes Test, trust game and questionnaire, IQ, as well as assessments given by the adolescents' parent or guardian: Millon Clinical Multiaxial Inventory III, Systemic Inventory of Change, the Reading the Mind in the Eyes Test)
Other bias	High risk	**Treatment adherence** **Comment:** supervision sessions included listening to audiotaped sessions and scoring for adherence by consensus using specially developed adherence scales (a copy of the adherence scales is available from the first author on request, see p 1313). However, results of adherence ratings were not presented. **Allegiance bias** **Comment:** one of the authors (Fonagy) is one of the developers of MBT and both authors designed and manualised the 12-month intervention program MBT-A **Attention bias** **Comment:** number of hours of clinical attention received by the two groups did not differ

Salzer 2014

Study characteristics

Methods	6-month trial with 2 arms 1. Inpatient psychodynamic therapy (PDT) 2. Waiting-list/treatment-as-usual (WL/TAU) **Duration of trial:** 6 months

Salzer 2014 *(Continued)*

	Country: Germany **Setting:** inpatient and outpatient
Participants	**Method of recruitment of participants:** during initial interview at a child and adolescent psychiatric outpatient clinic **Sample size:** 66 **Diagnosis of borderline personality disorder**: 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 16.49 years (range = 14-19 years) **Sex:** 77.7% female **Comorbidity:** all participants fulfilled ICD-10 criteria for a diagnosis of F92 (mixed disorder of conduct and emotions) **Inclusion criteria** 1. Mixed disorder of conduct and emotions (ICD-10, F92) 2. Aged 14-19 years 3. Willing to undergo inpatient treatment **Exclusion criteria** 1. Significant prenatal or perinatal impairment 2. IQ below 80 3. Psychotic or psychotic-like disorders 4. Acute alcohol/substance abuse 5. Severe antisocial behaviour
Interventions	**Experimental group** **Treatment name:** PDT **Number randomised to group:** 32 **Duration:** 6 months **Concomitant psychotherapy:** inpatient treatment programme, additional treatment **Concomitant pharmacotherapy:** tempory pharmacologic treatment to prevent premature discharge in cases of serious impulse control difficulties **Control/comparison group** **Comparison name:** WL/TAU **Number randomised to group:** 34 **Duration:** 6 months **Concomitant psychotherapy:** allowed to make use of any alternative psychotherapeutic treatments **Concomitant pharmacotherapy:** allowed to make use of any psychopharmacological treatments **Proportions of participants taking standing psychotropic medication during trial observation period:** “In the treatment group, 21 patients (65.6%) received pharmacotherapy during inpatient treatment; neuroleptics (n = 2) or atypical neuroleptics (n = 11), tricyclic antidepressants (n = 5), selective serotonin reuptake inhibitors (n = 3), methylphenidate (n = 3) and an anticonvulsant medication (n = 1) were used.“ (p. 2218); medication use in control group not specified.
Outcomes	**Secondary** 1. Anger, assessed with the hostility subscale of the Symptom Checklist-90-Revised (SCL-90-R)

Salzer 2014 *(Continued)*

	2. Interpersonal problems, assessed with the interpersonal sensitivity subscale of the SCL-90-R
Notes	**Sample size calculation:** yes **Ethics approval:** approved by the ethics committee at the University of Goettingen. Adolescent patients and their parents were asked for written consent. **Comments from review authors:** 1. We received additional data from Dr Salzer by email on 15 July 2018.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "randomly assigned [...] by simple randomization that was conducted by the staff of the out-patient clinic." (p 2214) **Comment:** not enough information to make a clear judgement of 'high' or 'low' risk of bias
Allocation concealment (selection bias)	Unclear risk	**Quote:** "randomly assigned [...] by simple randomization that was conducted by the staff of the out-patient clinic." (p 2214) **Comment:** not enough information to make a clear judgement of 'high' or 'low' risk of bias
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quotes:** "Independent assessor" (p 2214). "An independent, trained assessor provided all diagnoses based on a structured interview with the adolescent. This clinical psychologist completed intensive training on the SCID and was not involved in the randomization process, treatment planning or therapy." (p 2216)
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Quotes:** "For all analyses, the ITT sample was used. In case of missing scores, the last observation carried forward (LOCF) method was applied." (p 2217) "The comparable dropout rates were 15.6% (n = 5) in the treatment group and 17.6% (n = 6) in the WL/TAU condition (p = 0.71). We found no significant differences between the patients who dropped out versus those who remained within the trial regarding number of diagnoses or symptom impairment either within the conditions or in the overall sample (all p > 0.29)." (p 2217)
Selective reporting (reporting bias)	Unclear risk	**Comment:** a study protocol was not available; therefore, there was insufficient information to permit judgement of high or low risk of bias.
Other bias	High risk	**Affiliation bias** **Comment:** treatment developer (A Streeck-Fischer) of the the treatment under investigation is the senior author of the study. **Treatment adherence** **Quote:** "All therapists were trained in the PDT and attended an intensive workshop that covered the treatment manual. The therapists were under weekly supervision by the manual's author. To further ensure treatment fidelity, several videotaped treatment sessions were discussed during the supervision. Treatment adherence was checked in randomly selected videotaped sessions by independent raters based on manual checklists." (p 2214) **Attention bias** **Comment:** Participants in the experimental group received inpatient treatment, whereas participants in the control group were put a waiting list and did

Salzer 2014 *(Continued)*

	not receive any treatment by default (though they were allowed to optionally use alternate treatments if necessary).

Santisteban 2015

Study characteristics	
Methods	7-month trial with 2 arms 1. Integrative borderline personality disorder-oriented adolescent family therapy (I-BAFT) 2. Individual drug counseling (IDC) **Duration of trial:** 7 months **Country:** USA **Setting:** university centre
Participants	**Method of recruitment of participants**: About two-thirds of youths were referred from the juvenile justice system: 38% from the Miami-Dade Juvenile Services Department and 32% from a juvenile addictions receiving facility. 30% were referred by school counselors or the community in general. **Sample size:** 40 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Revised Diagnostic Interview for Borderlines (RDIB) **Mean age**: I-BAFT = 16 years (standard deviations = 0.8), IDC = 15.6 years (standard deviations = 0.8) **Sex:** 35-40% female **Comorbidity:** substance use disorder on the basis of the last 12 months (even if there was no documented use in the past 30 days), depression (I-BAFT = 35%, IDC = 40%) **Inclusion criteria** 1. Aged 14-17 years 2. Meeting criteria for borderline personality disorder 3. Meeting criteria for substance abuse (in the last 12 months) 4. At least 1 caregiver in each family should participate **Exclusion criteria:** none stated
Interventions	**Experimental group** **Treatment name:** I-BAFT **Number randomised to group:** 20 **Duration:** 7 months **Control/comparison group** **Comparison name:** IDC **Number randomised to group:** 20 **Duration:** 7 months **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** not stated **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear

Santisteban 2015 *(Continued)*

Outcomes	**Primary** 1. Borderline personality disorder severity, assessed by the RDIB and adolescent reports on the Borderline Personality subscale of the Millon Adolescent Clinical Inventory (MACI) **Secondary** 1. Depression, assessed by the Diagnostic Interview Schedule for Children – Predictive Scales (DPS) 2. Attrition, in terms of patients lost after randomisation in each group 3. Adverse effects, measured by spontaneous reporting (reports of inpatients)
Notes	**Sample size calculation:** no **Ethics approval:** yes **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Permuted block randomization stratified by gender, race/ethnicity and drug use severity in the past 30 days". (p 57)
Allocation concealment (selection bias)	Unclear risk	**Comment:** not enough information provided to enable a judgement of high or low bias
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "Assessors were not blind to the intervention." (p 57)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no sensitivity analysis was performed after multiple imputations. Relatively high dropout (33% self-reported substance, 38% urine samples, 33% borderline personality disorder behavior)
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol was available to enable a clear assessment of selective reporting bias.
Other bias	High risk	**Treatment adherence** **Quote:** "Each therapist was trained by an expert in their respective conditions and met weekly with a supervsor and fellow therapists to view videotaped therapy sessions and to discuss the implementation of the manualised interventions with a high degree of adherence and fidelity". (p 58) **Comment:** unclear whether adherence ratings were applied **Allegiance bias** **Comment:** I-BAFT was developed by the authors. **Attention bias** **Comment:** matched dosage I-BAFT **Quotes:** "I-BAFT delivered weekly family therapy, individual herapy, and skills-building intervention in a two-sessions-per-week format over a 7-month period". (p 58) "IDC was administered in a two-sessions-per-week format implemented over a 7-month period". (p 58)

Schilling 2018

Study characteristics	
Methods	4-week trial with 2 arms 1. Metacognitive training for borderline patients (B-MACT) 2. Active control intervention (PMR) **Duration of trial:** 4 weeks **Duration of participation:** 4 weeks **Country:** Germany **Setting:** not stated
Participants	**Method of recruitment of participants:** recruited from the Deparment of Psychiatry of the Asklepios clinic, Germany **Sample size:** 48 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** B-MACT = 29.36 years (standard deviation = 10.46), PMR = 31.15 years (standard deviation = 9.59) **Sex:** 91.7% female **Comorbidity:** 31% = major depressive disorder, 23% = any anxiety disorder (including 12 patients with PTSD), 7% = alcohol or substance abuse, 9% = dependence **Inclusion criteria** 1. Diagnosis of borderline personality disorder 2. Aged 18-65 years old **Exclusion criteria** 1. History of severe neurological disorder 2. Intelligent quotient less than 70 3. Diagnosis of bipolar disorder 4. Schizophrenia or dementia 5. Alcohol or substance dependence with consumption in last 4 weeks
Interventions	**Experimental group** **Treatment name:** B-MACT **Number randomised to group**: 22 **Duration:** 4 weeks **Control/comparison group** **Comparison name:** PMR **Number randomised to group:** 26 **Duration:** 4 weeks **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** yes; 56 of the 74 treated with psychotropic medication, not specified by group **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary**

Schilling 2018 *(Continued)*

	1. Borderline personality disorder severity, assessed by a translation of the clinician-administered Zanarini Rating Scale for BPD (ZAN-BPD) **Secondary** 1. Depression, assessed by the Beck Depression Inventory 2. Attrition, in terms of patients lost after randomisation in each group
Notes	**Sample size calculation:** no sample calculation **Ethics approval:** yes **Comments from review authors:** 1. We received an additional article sent by email from Dr Schilling on 22 January 2019.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** no information about randomisation method provided
Allocation concealment (selection bias)	Unclear risk	**Comment:** no information about allocation concealment provided
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no information about the blinding of assessors provided
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no data on attrition, no mention of ITT or imputation method
Selective reporting (reporting bias)	Unclear risk	**Comment:** no protocol found preventing us from making a clear assessment of reporting bias
Other bias	High risk	**Treatment adherence** **Comment:** no data on treatment adherence **Allegiance bias** **Comment:** first author was principal investigator and delivered both interventions. She also developed the manual for B- MACT. **Attention bias** **Comment:** interventions were similar in length.

Schuppert 2012

Study characteristics

Methods	17-week trial with 2 arms 1. Emotion regulation training (ERT) 2. Treatment-as-usual (TAU) **Duration of trial:** 17 weeks

Schuppert 2012 *(Continued)*

	Country: The Netherlands **Setting:** outpatient
Participants	**Method of recruitment of participants:** referral from 1 of 4 mental health centers (for emotion regulation problems or borderline personality disorder features) **Sample size:** 109 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) (at least 2 borderline personality disorder criteria); 73% of final sample met full criteria for borderline personality disorder. **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 15.98 years (standard deviation = 1.22) **Sex:** not stated **Comorbidity:** 33 % had excessive use of alcohol, 29 % used addictive drugs and psychotropic medications (however, substance-dependent patients were excluded). **Inclusion criteria** 1. Met a minimum of 2 borderline personality disorder criteria according to SCID II 2. Anxiety disorders, mood disorders, or attention-deficit/hyperactivity disorder (ADHD) could be present as comorbid disorders but not the primary diagnosis **Exclusion criteria** 1. Psychotic disorders 2. Conduct disorders 3. Substance dependence 4. IQ below 80
Interventions	**Experimental group** **Treatment name:** ERT **Number randomised to group:** 54 **Duration:** 17 weeks **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 55 **Duration:** not specified **Both groups** **Concomitant psychotherapy:** yes, free to use mental health care services **Concomitant pharmacotherapy:** yes, 29.4% on any medication at baseline **Proportions of participants taking standing psychotropic medication during trial observation period:** no significant differences between groups with regard to medication at baseline or follow-up
Outcomes	**Primary**

Schuppert 2012 *(Continued)*

1. Borderline personality disorder severity, assessed by Borderline Personality Disorder Severity Index, Version IV, for adolescents (BPDSI-IV-A)

Secondary

1. Affective instability, assessed by the affective instability subscale of the BPDSI-IV-A

Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Comment:** stratified randomisation **Quote:** "Randomization by drawing lots was performed by an independent, masked research assistant who was not involved in the project." (p 1316)
Allocation concealment (selection bias)	Low risk	**Quote:** "Randomization by drawing lots was performed by an independent, masked research assistant who was not involved in the project." (p 1316)
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "The assessments were conducted by research psychologists who were blinded to the treatment condition." (p 1317)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** 19% attrition in total. ITT analysis used. Reasons for attrition were not stated – could have been unevenly distributed across groups.
Selective reporting (reporting bias)	High risk	**Comment:** In the protocol, the following outcomes were mentioned: Life Problems Inventory, measuring main symptoms of BPD (however, only the subscale on affective instability reported), Rutgers Alcohol Problems Index, Strengths and Difficulties Questionnaire, raising style, parental stress and parental functioning, consumption of public health services and global functioning. None of these outcomes were reported in the final report. In particular, data from the Children's Depression Inventory (which would have been relevant for this review) were missing. Number of non-completers (flow-chart) inconclusive and not reported for the TAU group
Other bias	High risk	**Treatment adherence** **Quotes:** "To increase treatment adherence and comparability among the centers, the manuals were highly structured. The treatment integrity of a random sample of 20 audiotaped sessions was checked by an independent rater." (p 1317); "The competence of all therapists was found to be accurate. On average, the sessions covered 92.4% of the ERT manual." **Allegiance bias** **Quote:** "Drs. Schuppert, van Gemert, and Wiersema are authors of the manual on Emotion Regulation Training that is commercially available in the Netherlands." (p 1323) **Attention bias** **Comment:** no information about the duration of the treatment-as-usual group

Sinnaeve 2018

Study characteristics	
Methods	9-12-month trial with 2 arms 1. Step down dialectical behaviour therapy (DBT) (9 months) 2. Standard outpatient DBT (12 months) **Duration of trial:** 9 months for step-down DBT, and 12 months for standard outpatient DBT **Country:** The Netherlands **Setting:** inpatient and outpatient
Participants	**Method of recruitment of participants:** not stated **Sample size:** 84 **Diagnosis of borderline personality disorder**: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision (DSM-IV-TR) **Means of assessment**: Participants were screened with the Vragenlijst Kenmerken Persoonlijkheid. Presence of Axis 1 and Axis 2 disorders assessed with the Mini-International Neuropsychiatric Interview and the Structured Clinical Interview for DSM Disorders **Mean age:** step-down DBT = 26.15 years (standard deviation = 6.18), standard outpatient DBT = 25.63 years (standard deviation = 7.45) **Sex:** 95% female **Comorbidity:** "Almost one third of the sample reported a history of sexual abuse (N = 16, 29%) and more than half experienced physical abuse (N = 30, 55%). One out of three participants suffered from post-traumatic stress disorder (N = 17, 31%), half were diagnosed with major depression (N = 28, 51%), and one out of three participants fulfilled criteria of substance dependence (N = 17, 31%)". (quote, p5) **Inclusion criteria** 1. Provided written informed consent 2. Met DSM-IV-TR criteria for borderline personality disorder (identical to the criteria in DSM-5) 3. Aged between 18–45 years old 4. Scored higher than 24 on the BPDSI-IV 5. Reported at least 1 episode of self-injurious behavior within the month before intake. If there was no episode of self-injurious behaviour 1 month before the intake, then a BPDSI-IV score of at least 30 was required to be eligible for the study. **Exclusion criteria** 1. Chronic psychotic disorder 2. Bipolar I disorder 3. Intellectual disability 4. Substance dependence requiring detoxification 5. Involuntary psychiatric treatment 6. Insufficient command of Dutch or living outside of travelling distance from the treatment centre
Interventions	**Experimental group** **Treatment name:** step-down DBT **Number randomised to group:** 42

Sinnaeve 2018 *(Continued)*

Duration: 9 months

Control/comparison group

Comparison name: standard outpatient DBT

Number randomised to group: 42

Duration: 12 months

Both groups:

Concomitant psychotherapy: not stated

Concomitant pharmacotherapy: not stated

Proportions of participants taking standing psychotropic medication during trial observation period: unclear

Outcomes

Primary

1. Borderline personality disorder severity, assessed by the BPDSI-IV
2. Self-harm, assessed by the BPDSI-IV
3. Suicide-related outcomes, assessed by the BPDSI-IV
4. Mental health status, assessed by the 5-level EQ-5D

Secondary

1. Anger, assessed by the BPDSI-IV
2. Affective instability, assessed by the corresponding subscale of the BPDSI-IV
3. Chronic feelings of emptiness, assessed by the BPDSI-IV
4. Impulsivity, assessed by the BPDSI-IV
5. Interpersonal problems, assessed by the BPDSI-IV
6. Abandonment, assessed by the BPDSI-IV
7. Dissociation and psychotic-like symptoms, assessed by the BPDSI-IV
8. Attrition, in terms of patients lost after randomisation in each group
9. Adverse effects, assessed by spontaneous reporting

Notes

Sample size calculation: yes

Ethics approval: The protocol adhered to the principles outlined in the Declaration of Helsinki, approved by the Institutional Review Board and registered in www.clinicaltrials.gov.

Comments from review authors:

1. We received an unpublished copy of a new paper on 11 June 2018 from Dr Sinneva, as well as additional data sheets on subsample data on borderline personality disorder from Dr Sinneva on 9 October, and additional information about the data sheets on 15 November 2018.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote: "**a computer program, developed by the Amsterdam Medical Centre, generated the sequence. To increase the likelihood of comparable treatment groups, a minimization method was used. Minimization variables were BPDSI score ≥ 40, total lifetime LPC score ≥ 14 and age". (p 14)
Allocation concealment (selection bias)	Low risk	**Quote:** "we ensured that interventions were allocated by means of a concealed randomization procedure." (p 19)

Sinnaeve 2018 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "data collectors were not blind to the assigned intervention." (p 19)
Incomplete outcome data (attrition bias) All outcomes	High risk	**QuoteS:** "In step-down DBT, 53% of the participants who started DBT finished the entire 9-month program. Twelve months of outpatient DBT showed a retention rate of 63%. The results of the Kaplan Meier statistic indicated that there were no significant differences in the time to drop out between conditions, X2(1) = .36, p = .55." (p 17) In outpatient DBT, 23 out of 42 participants did not start the allocated treatment. This could be partially due to the fact that waiting times appeared to be longer in outpatient DBT. One participant died by suicide before he received outpatient DBT." (p 16) **Comment:** high attrition rates in outpatient DBT
Selective reporting (reporting bias)	High risk	**Quote:** "There are three differences between the study protocol in Trials and this report. First, the name of the residential program was changed from 'inpatient DBT' to 'residential DBT'. Second, our study ended prematurely due to an unexpected close-down of the Centre for Personality Disorders Jelgersma (CPJ). Third, because of unforeseen waiting list issues, participants who were randomized to outpatient DBT had to wait longer before they met their therapist." (p 14); "...the protocol was published in advance and all analyses were performed by independent experts" (p 19) **Comment:** The authors addressed changes made from protocol to full report. However, assessing change in level of psychopathological symptoms with The Brief Symptomatology Inventory (BSI)) was excluded as secondary outcome.
Other bias	High risk	**Treatment adherence** **Comment:** treatment adherence was evaluated in both conditions (see p 19). **Attention bias** **Comment:** differences in duration of treatment (9 months vs 12 months) **Allegiance bias** **Comment:** nothing found

Smith 2012

Study characteristics	
Methods	36-week trial with 2 arms 1. Interpersonal psychotherapy (IPT) 2. Treatment-as-usual (TAU) **Duration of trial:** 36 weeks **Country:** USA **Setting:** inpatient and outpatient
Participants	**Method of recruitment of participants:** " In total, 1,100 women seeking treatment in the clinic were screened by intake clinicians for study eligibility on the basis of presence of depressive symptoms and self- report of sexual abuse before age 18 and absence of exclusion criteria." (quote, p 2) **Sample size:** subsample = 70

Smith 2012 *(Continued)*

	Diagnosis of borderline personality disorder: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** no data for subsample. Full sample = 36.39 years (standard deviation = 9.86) **Sex:** 100% female **Comorbidity:** no data for subsample **Inclusion criteria** 1. 18 years or older 2. English speaking 3. Current major depression and childhood sexual abuse **Exclusion criteria** 1. Active psychosis 2. History of schizophrenia or bipolar disorder 3. Intellectual disability 4. Substance abuse or dependence within the previous 3 months 5. Current involvement in psychotherapy
Interventions	**Experimental group** **Treatment name:** IPT **Number randomised to group:** 17 (out of full sample of 37) **Duration:** 36 weeks **Control/comparison group** **Comparison name:** TAU **Number randomised to group:** 9 (out of full sample of 33) **Duration:** 36 **Both groups** **Concomitant psychotherapy:** "TAU was individual psychotherapy, TAU therapists described as supportive (53%), cognitive-behavioral or dialectical-behavioral (27%), integrated/eclectic (13%), and client-centered (7%)" (quote, p 4) **Concomitant pharmacotherapy:** "Women were permitted to enter the study regardless of antidepressant prescription status. A total of 43 women reported having been prescribed antidepressant medications at the baseline assessment (23 of those in the IPT condition, 20 of those in the TAU condition)." (p 125) **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Secondary** 1. Depression, assessed by the Beck Depression Inventory
Notes	**Sample size calculation:** yes **Ethics approval:** yes **Comments from review authors:** 1. We received additional data on BPD subsamples from Dr Smith on 5 July 2018.
Risk of bias	

Smith 2012 *(Continued)*

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** no clear information on randomisation procedure was available
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information on allocation concealment was provided
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Quote:** "One master's-level research assistant, who was aware of patients' treatment assignments, conducted all assessments." (p 125)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Quote:** "In intention-to-treat analyses, change over time was assessed with generalized linear models with inference based on generalized estimating equations (GEEs) (32). To test the assumption that data were missing completely at random (MCAR), logistic modeling was performed to determine whether missing assessment data depended on individual patients' observed responses in previous assessments (Table 2). When the probability of missing values was modeled for each outcome, we found that the shame subscale of the Differential Emotions Scale had informative dropout (P=.04) and violated the MCAR assumption. In that case, weighted GEEs were applied with individual weights estimated from the logistic model for missing data. Women with lower shame scores in earlier assessments were more likely to have missing data in later assessments."
Selective reporting (reporting bias)	High risk	**Comment:** extra outcomes included in full report, but not mentioned in the protocol are: 1. trauma history, assessed with the Childhood Trauma Questionnaire – Short Form, and with the Traumatic Life Events Questionnaire 2. PTSD symptoms, measured with the Modified PTSD Symptom Scale – Self Report 3. mental health–related functioning, assessed with the Medical Outcomes Study 36-Item Short-Form Health Survey summary score 4. social functioning, measured by the Social Adjustment Scale–Self Report 5. shame, assessed with the corresponding subscale of the Differential Emotions Scale Several outcomes included in full report. Not addressed. No clear differences between primary and secondary outcomes such as in protocol
Other bias	High risk	**Attention bias** **Quote:** "Interpersonal psychotherapy participants attended approximately twice as many sessions (12.9±6.5) as those in usual care (6.3±4.2), a significant between-group difference". (p 127) **Adherence bias** **Comment:** all interpersonal psychotherapy sessions were audiotaped or videotaped. The principal investigator reviewed 20% of taped sessions for treatment fidelity and addressed deviations from the model with the therapist. (See p 126) **Allegiance bias** **Comment:** none found

Soler 2009

Study characteristics	
Methods	3-month trial with 2 arms 1. DBT skills training (DBT-ST) 2. Standard group therapy (SGT) **Duration of trial**: 3 months **Country:** Spain **Setting:** outpatient
Participants	**Methods of recruitment of participants:** recruited from the outpatient borderline personality disorder unit at the Department of Psychiatry, Hospital de la Santa Creu i Sant Pau **Sample size:** 59 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and Revised Diagnostic Interview for Borderlines (DIB-R) **Mean age:** 29.2 years **Sex:** 81.3% female **Comorbidity:** not stated **Inclusion criteria:** 1. Fulfilled diagnostic criteria for borderline personality disorder on SCID-II and DIB-R 2. Aged from 18–45 years (inclusive) **Exclusion criteria** 1. Schizophrenia 2. Drug-induced psychosis 3. Organic brain syndrome 4. Alcohol or other psychoactive substance dependence 5. Bipolar disorder 6. Mental retardation 7. Major depressive episode in course 8. CGI-S score ≤ 4 (i.e. not at all, borderline, or mildly ill)
Interventions	**Experimental group** **Treatment name:** DBT-ST **Number randomised to group:** 32 **Duration:** 3 months (13 psychotherapy sessions of 120 minutes each) **Control/comparison group** **Comparison name:** SGT **Number randomised to group:** 32 **Duration:** 3 months (13 psychotherapy sessions of 120 minutes each)

Soler 2009 *(Continued)*

	Both groups **Concomitant psychotherapy:** participants did not receive any other individual or group psychotherapy. **Concomitant pharmacotherapy:** pharmacological therapy was continued if initiated prior to inclusion, but type and doses could not be modified during the study period. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary**: 1. BPD severity, assessed by the CGI-BPD 2. Mental health status, assessed by the Clinical Global Impression (CGI) scale 3. Suicidality, assessed by the CGI, suicidality subscale **Secondary**: 1. Anger, assessed by the CBI-BPD item on anger 2. Affective instability, assessed by the CGI-BPD item on affective instability 3. Chronic feelings of emptiness, assessed by the CGI-BPD item on emptiness 4. Impulsivity, assessed by the CGI-BPD item on impulsivity 5. Interpersonal problems, assessed by the CGI-BPD item on unstable relations 6. Dissociative/psychotic pathology, assessed by Brief Psychiatric Rating Scale 7. Depression, assessed by Hamilton Depression scale 17-items (Ham-D-17)
Notes	**Sample size calculation:** not stated **Ethics approval:** The study was approved by the ethics committee of the Hospital de la Santa Creu i Sant Pau and carried out in accordance with the Declaration of Helsinki. **Comments from review authors:** 1. We received information from Dr Soler by email on 15 December 2010.

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Blocks of four generated using the SPSS software program served for the randomisation to DBT-ST or SGT." (p 354)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no further details
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quotes:** "... participants were evaluated every two weeks by experienced psychiatrists. Subjects were instructed not to disclose any information about the group (topics, group members or therapists) to maintain blind conditions." (p 354); "Assessment and drug control were carried out by two psychiatrists who were masked to the experimental conditions." (p 355); "We are unable to affirm that all participants refrained from disclosing information about the therapy or the therapists with the psychiatric raters during assessment visits. [...] Indeed, the observer-rater scales obtained during the interview visits and the results from self-reported measures filled in by patients during the study showed a good concordance." (p 357)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no further details

Soler 2009 *(Continued)*

Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting from the published paper, but as there was no protocol available, there was insufficient information to permit judgement of 'high' or 'low' risk of bias
Other bias	Unclear risk	**Comment:** no further details

Stanley 2017

Study characteristics	
Methods	12-month trial with 4 arms 1. Dialectical behavior therapy (DBT) + fluoxetine 2. DBT + placebo 3. Supportive therapy + fluoxetine 4. supportive therapy + placebo **Duration of trial:** 12 months **Country:** USA **Setting:** inpatient
Participants	**Method of recruitment of participants**: recruited from emergency departments, clinician referrals and advertisements. Recruitment period ended 6 months prior to study end date. **Sample size:** 86 **Diagnosis of borderline personality disorder:** not stated **Means of assessment:** not stated **Age:** not stated **Sex:** not stated **Comorbidity:** not stated **Inclusion criteria** 1. Meets criteria for diagnosis of borderline personality disorder 2. History of at least 1 suicide attempt or self-mutilation episode 12 months prior to study entry 3. Experiences continued urges to self-mutilate or attempt suicide 4. Stable living situation 5. Use of effective birth control if sexually active 6. Clinically stable enough to tolerate placebo condition 7. Not participating in other forms of treatment during the study **Exclusion criteria** 1. Any current organic mental syndromes, lifetime schizophrenic or bipolar disorders, psychotic disorders, or mental retardation 2. Inability to complete psychiatric interview due to lack of cooperation or lack of comprehension 3. Unable to tolerate fluoxetine or DBT 4. Currently receiving treatment for an acute medical illness or other debilitating problem, including substance abuse or anorexia nervosa 5. History of major depression lasting more than 3 months 6. Current Hamilton depression score above 22 and not receiving treatment 7. Pregnant or breastfeeding
Interventions	**Experimental group**

Stanley 2017 *(Continued)*

Treatment name: DBT + fluoxetine
Number randomised to group: 18
Duration: 12 months

Control/comparison group 1
Comparison name: DBT + placebo
Number randomised to group: 19
Duration: 12 months

Control/comparison group 2

Comparison name: supportive therapy + fluoxetine
Number randomised to group: 20
Duration: 12 months

Control/comparison group 3
Comparison name: supportive therapy + placebo
Number randomised to group: 18
Duration: 12 months

All groups

Concomitant psychotherapy: not stated
Concomitant pharmacotherapy: all participants were washed out of psychotropic medications and received fluoxetine or placebo, depending on randomisation (50% of each group received fluoxetine or placebo). Benzodiazapines were permitted for sleep.

Proportions of participants taking standing psychotropic medication during trial observation period: 50% of each group were taking fluoxetine.

Outcomes

Primary

1. Suicide-related outcomes, assessed by total counts of attempted suicide attempts over the course of the 12-month treatment period (sum of 6, bimonthly assessments during the treatment phase)

Secondary

1. Attrition, in terms of patients lost after randomisation in each group
2. Adverse effects, measured by spontaneous reporting

Notes

Sample size calculation: not stated
Ethics approval: not stated

Comments from review authors:

1. Data available at clinicaltrials.gov/ct2/show/results/NCT00533117

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Comment:** no clear information on randomisation method was provided
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information on allocation concealment was provided
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Comment:** outcome assessors were masked to treatment allocation

Stanley 2017 *(Continued)*

Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** dropout rates were even across groups, total rates were around ¼ of participants; no information provided on ITT, but all randomised participants were analysed
Selective reporting (reporting bias)	Low risk	**Comment:** NCT00533117: no apparent bias
Other bias	Unclear risk	**Treatment adherence** **Comment:** adherence not stated **Attention bias** **Comment:** equal treatment in four groups **Allegiance bias** **Comment:** nothing found

Turner 2000

Study characteristics	
Methods	12-month trial with two arms 1. Dialectical behavior therapy - oriented treatment (DBT) 2. Client-centered therapy (CCT) **Duration of trial:** 12 months **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** not stated **Sample size:** 24 **Diagnosis of borderline personality disorders:** Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition revised (DSM-III-R) **Means of assessment**: Revised Diagnostic Interview for Borderlines (DIB-R) **Mean age:** 22 years **Sex:** 79.2% female **Comorbidity:** 23 patients met criteria for a comorbid Axis I disorder. The majority was diagnosed with dysthymia + comorbid generalised anxiety disorder (n = 17). 3 patients met criteria for major depressive disorder, 3 met criteria for dysthymia, 18 met criteria for alcohol abuse, and 20 met criteria for substance abuse. Most patients (n = 18) met criteria for 2 additional personality disorders. **Inclusion criteria** 1. Diagnosis of borderline personality disorder **Exclusion criteria** 1. Schizophrenia 2. Schizoaffective disorder 3. Bipolar disorder

Turner 2000 *(Continued)*

4. Organic mental disorders
5. Mental retardation

Interventions	**Experimental group** **Treatment name:** DBT **Number randomised to group:** 12 **Duration:** 12 months **Control/comparison group** **Comparison name:** client-centered therapy (CCT) **Number randomised to group:** 12 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** pharmacotherapy was not included in the study treatment regimens; at baseline, 19 patients were out of 24 reported taking prescribed psychotropic medications. **Proportions of participants taking standing psychotropic medication during trial observation period:** At post-treatment, 4 DBT patients and 10 CCT patients were taking any medication, difference not significant.
Outcomes	**Primary** 1. Suicidal ideation, assessed by Beck Scale for Suicide Ideation 2. Parasuicidality, assessed by Target Behaviour Rating (TBR) - frequency of parasuicide **Secondary** 1. Anger, assessed by TBR - anger 2. Impulsivity, assessed by TBR - impulsiveness 3. Depression, assessed by Beck depression Inventory 4. Dissociative/psychotic symptoms, assessed by Brief Psychiatric Rating Scale
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "Following the initial assessments, patients were randomly assigned to either DBT or CCT." (p 415) **Comment:** no further details provided
Allocation concealment (selection bias)	Unclear risk	**Quote:** "Next, patients were sequentially assigned to a mental health clinician." (p 415) **Comment:** no further details provided

Turner 2000 *(Continued)*

Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "The outcome evaluation consisted of independent assessor ratings and patient self-report. The independent assessor was unaware of the patients' treatment condition but was aware of the purpose of the study." (p 415)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** 24 participants were randomly assigned to either DBT (n = 12) or CCT (n = 12). In spite of dropouts from treatment (DBT: n = 4, CCT: n = 6), assessments were available for all 24 participants at all times of assessment.
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting, but Insufficient information to permit judgement of 'high' or 'low' risk of bias
Other bias	Unclear risk	**Comment:** no further details

Van den Bosch 2005

Study characteristics	
Methods	12-month trial with two arms 1. Dialectical behavior therapy (DBT) 2. Treatment-as-usual (TAU) **Duration of trial:** 12 months **Country:** The Netherlands **Setting:** outpatient
Participants	**Methods of recruitment of participants:** recruited from mental health institutions (n = 39) and addiction treatment services (n = 19) **Sample size:** 58 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) **Mean age:** 34.9 years (standard deviation = 7.7) **Sex:** 100% female **Comorbidity:** with or without substance use disorder **Inclusion criteria** 1. Female 2. Age 18–65 years 3. DSM-IV diagnosis of borderline personality disorder according to the SCID-II with at least 6 diagnostic criteria of borderline personality disorder present **Exclusion criteria** 1. Bipolar disorder 2. (Chronic) psychotic disorder 3. Severe cognitive impairments 4. Insufficient command of the Dutch language
Interventions	**Experimental group**

Van den Bosch 2005 *(Continued)*

	Treatment name: dialectical behavior therapy (DBT) **Number randomised to group:** 27 **Duration:** 12 months **Control/comparison group** **Comparison name:** treatment-as-usual **Number randomised to group:** 21 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** not stated **Concomitant pharmacotherapy:** no significant differences between the 2 groups with regard to medication use at baseline **Proportions of participants taking standing psychotropic medication during trial observation period:** "Medication use was monitored [...9. The greater improvement in the dialectical behaviour therapy group could not be explained by greater or other use of psychotropic medications by these patients. In both conditions, three-quarters of the patients reported use of medication from one or more of the following categories: benzodiazepines, selective serotonin reuptake inhibitors (SSRIs), tricyclic antidepressants, mood stabilisers and neuroleptics. Use of SSRIs was reported by 14 (52%) of the dialectical behaviour therapy patients and 19 (61%) of treatment-as-usual patients ($\chi 2=0.44$; P=0.509). These findings eliminate the possibility of confounding by medication use". (Verheul 2003, p 137)
Outcomes	**Primary**: 1. Parasuicidal behaviour, assessed by Lifetime Parasuicide Count (LPC) self-mutilative acts during previous 3-month period **Secondary:** 1. Impulsivity, assessed by the Borderline Personality Disorder Severity Index-IV (BPDSI-IV- impulsivity)
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "...patients were randomly assigned to treatment conditions. A minimisation method was used to ensure comparability of the two treatment conditions on age, alcohol problems, drug problems and social problems (as measured by the European version of the Addiction Severity Index [...]". (Verheul 2003, p 135)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no further details
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quote:** "although the research assessors were not informed about the treatment condition of their interviewees, it is unlikely that they remained 'masked' throughout the project. Patients might have given them this information, or it

Van den Bosch 2005 *(Continued)*

		could easily have been derived from some of the interviews." (Verheul 2003, p 139)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no further details
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting, but Insufficient information to permit judgement of 'high' or 'low' risk of bias
Other bias	Unclear risk	**Comment:** no further details

Weinberg 2006

Study characteristics	
Methods	Randomised controlled trial **Duration of trial**: 6 weekly sessions **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** from community through advertising **Sample size:** 30 **Diagnossis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment**: Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II) and Revised Diagnostic Interview for Borderlines (DIB-R) **Mean age:** 28.2 years **Sex:** 100% female **Comorbidity:** patients with comorbid disorders were excluded **Inclusion criteria:** 1. SCID-II and DIB-R - both sets of criteria had to be met for inclusion **Exclusion criteria** 1. Comorbid psychotic disorders 2. Bipolar I disorder 3. Substance dependence 4. Elevated suicide risk
Interventions	**Experimental group** **Treatment name:** manual-assisted cognitive treatment (MACT) **Number randomised to group:** 15 **Duration:** 6 sessions **Control/comparison group**

Weinberg 2006 *(Continued)*

	Comparison name: treatment-as-usual (TAU) **Number randomised to group:** 15 **Duration:** 6 sessions **Both groups** **Concomitant psychotherapy:** both manual-assisted cognitive treatment (MACT) and treatment-as-usual (TAU) participants received treatment as usual; all participants took part in additional treatments that were not further specified. **Concomitant pharmacotherapy:** both manual-assisted cognitive treatment (MACT) and treatment-as-usual (TAU) participants received treatment-as-usual; proportions of participants with medication did not differ at baseline; Fisher = 0.36, df = 1. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary:** 1. Suicidality, assessed by The Suicide Behaviors Questionnaire (SBQ) 2. Parasuicidality, assessed by the Parasuicide History Interview (PHI) - deliberate self-harm frequency
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "randomly assigned" (p 485) **Comment:** no further details provided regarding randomisation method
Allocation concealment (selection bias)	Unclear risk	**Comment:** no further details
Blinding of outcome assessment (detection bias) All outcomes	Low risk	**Quotes:** "The baseline assessment and administration of the MACT [i.e. the treatment under test] were performed by the primary investigator." (p 486); "Interviewers were randomly assigned for following assessments. The interviewers were blind to baseline ratings and to participants' group allocation". (p 487)
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** After screening of 60 referrals by phone, 37 were invited for further assessments. Reasons for exclusion of 7 participants given. 30 participants included in the final sample; n = 15 assigned to the EG and n = 15 to the CG
Selective reporting (reporting bias)	Low risk	**Comment:** no indications for selective reporting
Other bias	Unclear risk	**Comment:** no further details

Zanarini 2008

Study characteristics	
Methods	12-week trials with two arms 1. Psychoeducation workshop (PEW) 2. Waiting list (WL) **Duration of trial:** 12 weeks **Country:** USA **Setting:** outpatient
Participants	**Methods of recruitment of participants:** from community through advertising **Sample size:** 50 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Revised Diagnostic Interview for Borderlines (DIB-R) and Diagnostic Interview for DSM-IV Personality Disorders (DIPD-IV) **Mean age:** 19.3 years (standard deviation = 1.4) **Sex:** 100% female **Comorbidity:** lifetime axis I disorders: 39 (78%) met criteria for a mood disorder (mostly major depression), 20 (40%) met criteria for a substance use disorder, 14 (28%) met criteria for an anxiety disorder, and 25 (50%) for an eating disorder. Current prevalence not specified **Inclusion criteria** 1. DIB-R and DIPD-IV - both sets of criteria had to be met for inclusion. **Exclusion criteria** 1. Current of lifetime schizophrenia 2. Schizoaffective disorder 3. Bipolar I disorder 4. Current substance dependence (except for nicotine dependence) 5. Any type of current psychiatric treatment
Interventions	**Experimental group** **Treatment name:** psychoeducation workshop (PEW) **Number randomised to group:** 30 **Duration:** 12 weeks **Control/comparison group** **Comparison name:** waiting list (WL) **Number randomised to group:** 20 **Duration:** 12 weeks **Both groups** **Concomitant psychotherapy:** participants that were in any type of current psychiatric treatment were not eligible for study participation.

Zanarini 2008 *(Continued)*

	Concomitant pharmacotherapy No significant differences at baseline on treatment histories. 20% had taken medication previously. **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary:** 1. Impulsivity, assessed by Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD) 2. Psychological functioning, assessed by ZAN-BPD
Notes	**Sample size calculation:** not stated **Ethics approval:** not stated **Comments from review authors:** none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Unclear risk	**Quote:** "Using a 3:2 ratio, subjects were either randomized to a workshop that took place within a week of diagnostic disclosure or a waitlist." (p 286) **Comment:** no further details on method of randomisation provided
Allocation concealment (selection bias)	Unclear risk	**Quote:** "Fifty subjects were found to meet study criteria for BPD and five who were interviewed did not. These 50 subjects were either randomized to immediate (N = 30) or delayed (N = 20) psychoeducation." (p 286) **Comment:** no information given about dropouts during the study course
Blinding of outcome assessment (detection bias) All outcomes	Unclear risk	**Comment:** no information given if assessors were blind to treatment allocation
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	**Comment:** no clear details are provided about attrition rate
Selective reporting (reporting bias)	Unclear risk	**Comment:** no indication of selective reporting, but there was Insufficient information to permit a clear judgement of 'high' or 'low' risk of bias
Other bias	Unclear risk	**Comment:** no further details

Zanarini 2018

Study characteristics

Methods	12 month trial with 2 arms 1. Internet-based psychoeducation treatment group 2. Internet-based control group with no psychoeducation **Duration of trial:** 12 months **Country:** USA **Setting:** outpatient

Zanarini 2018 *(Continued)*

Participants	**Method of recruitment of participants:** "Recruitment of 80 women between the ages of 18 and 30 years was accomplished through internet-based advertising in Boston area (primarily on Craiglist)". (quote, p 53) **Sample size**: 80 **Diagnosis of borderline personality disorder:** Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) **Means of assessment:** Structured Clinical Interview for DSM-IV Axis II Disorders (SCID-II), Revised Diagnostic Interview for Borderlines (DIB-R), Background Information Schedule, nonborderline modules of the Diagnostic Interview for DSM-IV Personality Disorders, and clinician-administered version of the Zanarini Rating Scale or Borderline Personality Disorder **Mean age:** internet-based psychoeducation treatment group = 21.9 years (standard deviation = 3.7), internet-based control group with no psychoeducation = 20.9 years (standard deviation = 3.1) **Sex:** 100% female **Comorbidity:** any mood disorder (58/80), any anxiety disorder (51/80), any substance use disorder (25/80), any eating disorder (16/80). Personality disorders: odd cluster (14/80), anxious cluster (45/80), dramatic cluster (excluding borderline personality disorder) (13/80) **Inclusion criteria** 1. Met both criteria for DIB-R and DSM-IV (dual diagnostic) to ensure inclusion of borderline personality disorder patients with serious psychopathology 2. From trial registry inclusion: a) female, b) aged 18 to 30 years, c) meets criteria for borderline personality disorder, d) intelligence quotient must be 71 or higher **Exclusion criteria** 1. Current or lifetime criteria for schizophrenia or schizoaffective disorder. 2. If they had a physical condition that can cause serious psychiatric symptoms (eg. Lupus, multiple sclerosis) 3. Serious substance abuse 4. Mental retardation 5. Acutely suicidal 6. Fully manic at the time of diagnostic assessment 7. Patient was excluded if they were in any type of psychiatric treatment 8. Exclusion criteria from trial registry: a) Males, b) Schizophrenia, Schizoaffective Disorder, Bipolar I, c) Serious Substance Use Disorder, d) Subjects cannot be in treatment at baseline
Interventions	**Experimental group** **Treatment name:** internet-based psychoeducation treatment **Number randomised to group:** 40 **Duration:** 12 months **Control/comparison group** **Comparison name:** internet-based control group with no psychoeducation **Number randomised to group:** 40 **Duration:** 12 months **Both groups** **Concomitant psychotherapy:** not stated but patients were excluded if they were in any type of psychiatric treatment **Concomitant pharmacotherapy:** patients in both groups were taking standing medication as needed at baseline; tendency of more medication use in active group, but not significantly so (treatment group: 32.5% with standing medication at baseline, control group: 15.0%) **Proportions of participants taking standing psychotropic medication during trial observation period:** unclear
Outcomes	**Primary**

Zanarini 2018 *(Continued)*

1. BPD severity, assessed by the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD), total score
2. Psychosocial functioning, assessed by the Sheehan Disability Scale

Secondary

1. Affective instability, assessed by the ZAN-BPD item on affective symptoms
2. Impulsivity, assessed by the ZAN-BPD items on impulsivity symptoms
3. Interpersonal problems, assessed by the ZAN-BPD items on interpersonal symptoms
4. Depression, assessed by the Clinically Useful Depression Outcome Scale
5. Attrition, in terms of patients lost after randomisation in each group

Notes

Sample size calculation: not stated
Ethics approval: yes

Comments from review authors: none

Risk of bias

Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	**Quote:** "Using a computer-generated list devised by our study statistician". (p 53)
Allocation concealment (selection bias)	Unclear risk	**Comment:** no clear information was provided about allocation concealment.
Blinding of outcome assessment (detection bias) All outcomes	High risk	**Comment:** the trial was open-label meanng there was no blinding. Outcome measurements were based on self-report completed on the internet, all assesssments were thus unblinded.
Incomplete outcome data (attrition bias) All outcomes	Low risk	**Comment:** low attrition rate. 98% completion in EG, and 95% completion in CG. Authors conducted ITT analyses, but did not provide information on imputation method.
Selective reporting (reporting bias)	High risk	**Comment:** Work and Social Adjustment Scale was in the protocol but was excluded from final report. The self-report version of the ZAN-BPD was included as an extra outcome in full report relative to the trial registry. No clear indication in trial of which outcome were designated primary and secondary in the registry. 'Borderline evaluation of severity over time' was the only primary outcome.
Other bias	Unclear risk	**Attention bias** **Quote:** "Both groups participated in 15 assessment periods that were divided into an acute phase (weeks 1-12), and a maintenance phase (months 6, 9, 12)". (p 54) **Treatment adherence** **Comment:** no information **Allegiance bias** **Comment:** none found

ACT: acceptance and commitment therapy
ADHD: attention deficit hyperactivity disorder
AE: adverse events

AIAQ: Anger, Irritability and Assault Questionnaire
ANOVA: analysis of variance
APA: American Psychiatric Association
ASIQ-S: Adult Suicidal Ideation Questionnaire
AT: art therapy
AUDIT: Alcohol Use Disorders Identification Test
BPDFS: Borderline Personality Disorder Feature Scale
BPDSI-IV: Borderline Severity Index, version IV
BDI: Beck Depression Inventory
BDI-II: Beck Depression Inventory-Revision
BEST: Borderline Evaluation of Severity over Time
BHS: Beck Hopelessness Scale
BIS: Barrett Impulsiveness Scale
B-MACT: meta-cognitive training for borderline patients
BMI: body mass index
BPD-40: Borderline Personality Disorder Checklist-40
BPDSI-IV(-A): Borderline Severity Index, Version IV, for Adolescents
BPI: Borderline Personality Inventory
BPRS: Brief Psychiatric Rating Scale
BSI: Borderline Severity Index
BSL-23: Borderline Symptom List-23
BSS: Beck Scale for Suicidal Ideation
CAT: cognitive analytic therapy
CCT: client-centred therapy
CG: control group
CGI-BPD: Clinical Global Impression Scale for Borderline Personality Disorder Patients
CGI-S: Clinical Global Impression Scale-Severity scale
CI: confidence interval
CM: clinical management
CORE-OM: Clinical Outcomes in Routine Evaluation–Outcome Measure
CP: combination psychotherapy
CPT II: Conners' Continuous Performance Test II
CR: clinician-rated
CT: cognitive therapy
CTBE: community treatment by experts
DASS: Depression, Anxiety and Stress-Scale
DASS(-21): Depression, Anxiety and Stress Scale-21 items
DBT: dialectical behavior therapy
DBT-A: DBT adapted for adolescents
DB T-C: DBT couple therapy
DBT-I: DBT individual therapy plus activity group
DBT-IE: DBT interpersonal effectiveness group
DBT-M: DBT mindfulness group
DBT-PE: DBT-prolonged exposure
DBT-S: DBT skills group plus case management (DBT-S)
DBT-ST: DBT skills training
DDP: dynamic deconstructive psychotherapy
DERS: Difficulties in Emotion Regulation Scale
DES: Dissociative Experiences Scale
DHP: day-hospital psychotherapy
DIB-R: Revised Diagnostic Interview for Borderlines
DIPD-IV: Diagnostic Interview for DSM-IV Personality Disorders
DPS: Diagnostic Interview Schedule for Children-Predictive scales
DSH: deliberate self-harm
DSHI: Deliberate Self-Harm Inventory
DSM: Diagnostic and Statistical Manual of Mental Disorders
DSM-III-R: Diagnostic and Statistical Manual of Mental Disorders, 3rd Edition, Revised
DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition
DSM-IV-TR: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition, Text Revision
DSM-5: Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
ECR: Experiences in Close Relationships Scale
EIT: emotional intelligence training

EG: experimental group
E-PDT: psychodynmaic therapy by experts in personality disorders
EQ-5D: EuroQol-5 Dimensions Questionnaire
ERGT: emotion regulation group therapy
ERT: emotion regulation training
EUC: enhanced usual care
FSCRS: Forms of Self-Criticism/Self-Attacking and Self-Reassuring Scale
GAD: generalised anxiety disorder
GAF(S): Global Assessment of Functioning
GAS: Global Assessment Scale
GHQ: General Health Questionnaire
GPM: general psychiatric management
GSFT: group schema-focused therapy
GSI: Global Severity Index of the SCL-90-R
HADS: Hospital Anxiety and Depression Scale
HAM-D-17: Hamilton Depression Scale-17 items
HDRS-17: Hamilton Rating Scale for Depression
HoN-OS: Dutch version of the Health of the Nations Outcome Scales
HYPE: helping young people early
I-BAFT: integrative borderline personality disorder-oriented adolescent family therapy
ICD-10: International Classification of Diseases, 10th Revision
IDC: individual drug counselling
IIP(-C)(-SC): Inventory of Interpersonal Problems - Circumflex version/64-item version
IPDE: Interpersonal Personality Disorder Examination
IPT: interpersonal psychotherapy
IQ: intelligence quotient
IRR: incidence rate ratio
ITT: intention to treat
JCP: joint crisis plan
KDI: Ko's Depression Inventory
LIT: limited individual therapy
LKM/CM: loving-kindness and compassion meditation
LOCF: last observation carried forward
LPC: lifetime parasuicide count
LSASI: Lifetime Suicide Attempt Self-Injury interview
MADRS: Montgomery Asberg Depression Rating Scale
MCAR: missing completely at random
MACI: Millon Adolescent Clinical Inventory
MACT: manual-assisted cognitive psychotherapy
MBT: mentalisation-based treatment
MBT-A: MBT for adolescents
MBT-DH: day hospital MBT
MBT-ED: MBT for eating disorders
MBT-OP: outpatient MBT
MCMI-III: Millon Clinical Multiaxial Inventory, 3rd Edition
MCT: meta-cognitive training
MDD: major depressive disorder
MF: motivation feedback
MFQ: Mood and Feelings Questionnaire
MINI: Mini International Neuropsychiatric Interview
MOTR: motive-oriented therapeutic relationship
MSc: Master of Science
MT: mindfulness training
NOS: not otherwise specified
NR: not rated
ns: not specified
NSSI: non-suicidal self-injury
OAS-M: Overt Aggression Scale-Modified for outpatients
OIP: outpatient individual psychotherapy
OQ-45: Outcome Questionnaire-45
ORI: Object Relations Inventory
PAI-BOR: Personality Assessment Inventory - Borderline scale

PD: personality disorder
PDT: psychodynamic therapy
PDQ: Personality Disorders Questionnaire
PDSQ: Psychiatric Diagnostic Screening Questionnaire
PE: psychoeducation
PEPS: psychoeducation and problem solving therapy
PEW: psychoeducation workshop
PI: principal investigator
PIT: psychoanalytic-interactional therapy
PHI: Parasuicide History Interview
PP: per protocol
PRFP: psychic representation-focused psychotherapy
PTSD: post-traumatic stress disorder
RDIB: Revised Diagnostic Interview for Borderlines
SAPAS: Standardised Assessment of Personality: Abbreviated Scale
SASS: Social Adaptation Self-evaluation Scale
SASII: Suicide Attempt Self-Injury Interview
SAS-SR: Social Adaptation Scale-Self-Report
SB-APP: sequential brief Adlerian psychodynamic psychotherapy
SBQ: Social Behaviour Questionnaire
SCID-I/P: Structured Clinical Interview for DSM-IV Axis I Disorders Patient Edition
SCID-I: Structured Clinical Interview for DSM-IV Axis I Disorders
SCID-II: Structured Clinical Interview for DSM-IV Axis II Personality Disorders
SCL-90-R: Symptom Checklist-90-Revised
SCM-OP: structured clinical management-outpatient
SD: standard deviation
SF-12: 12-Item Short Form Health Survey
SFT(-G): schema-focused therapy -group
SFET: specialist first-episode psychosis treatment
SFQ: Social Functioning Questionnaire
SGT: standard group therapy
SHBCL: Self-Harming Behaviours Checklist
SIDP-IV: Structured Interview for DSM-IV Personality Disorders
SMFL: Short Motivation Feedback List
SMFQ: Self-report Mood and Feelings Questionnaire
SPS: Social Provisions Scale
SSCM-ED: specialist supportive clinical management for patients with eating disorders
SSHI: Suicide and Self-Harm Inventory
ST: schema therapy
S-TAU: specialist treatment as usual
STAXI: State-Trait Anger Expression Inventory
STEPPS: systems training for emotional predictability and problem solving
STM: supervised team management
SUD: substance use disorder
TA: therapeutic assessment
TAU: treatment-as-usual
TBR: Target Behaviour Rating
TTA: therapist telephone availability
UK: United Kingdom
WEMBS: Warwick-Edinburgh Mental Well-Being Scale
WHOQOL-BREF: World Health Organisation Quality of Life Instruments
WL: waiting list
WSAS: Work and Social Adjustment Scale
ZAN-BPD: Zanarini Rating Scale for Borderline Personality Disorder

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Ahmed 2016	Ineligible patient population

Study	Reason for exclusion
Andover 2017	Ineligible patient population
Andreasson 2016	Proportion of included participants with full BPD unclear. Unable to retreive further information
Apsche 2006	Ineligible patient population
Asarnow 2017	Ineligible patient population
Bamelis 2012a	Ineligible patient population
Bateman 2019b	Ineligible patient population
Bertsch 2013	Ineligible intervention
Bira 2014	Ineligible patient population
Brent 2018	Ineligible patient population
Brune 2012	Ineligible intervention
Buric 2019	Ineligible patient population
Cailhol 2014	Ineligible intervention
Carta 2014	Ineligible intervention
Carter 2013	Ineligible patient population
Chanen 2008	ineligible population (less than 70% BPD)
Charney 2015	Ineligible patient population
Coccaro 1997	Ineligible patient population
Cornelius 1993	Ineligible intervention
Cottrell 2018	Ineligible patient population
Crawford 2018b	Ineligible patient population
Cullen 2012a	Ineligible patient population
De Beurs 2013	Ineligible intervention
DeSaeger 2014	Ineligible patient population
Dunlop 2012	Ineligible patient population
Ehlers 2013	Ineligible patient population
Ekeblad 2016	Ineligible patient population
EUCTR 2010-020956-69	Ineligible intervention

Study	Reason for exclusion
EUCTR 2015-000749-21	Ineligible intervention
Fleischer 2015	Ineligible outcomes
Furuno 2018	Ineligible patient populaiton
Ghahramanlou Holloway 2012	Ineligible patient population
Ginty 2016	Ineligible patient population
Gold 2013	Ineligible intervention
Green 2011	Ineligible patient population
Grimholt 2015	Ineligible patient population
Ha 2016	Ineligible patient population
Haddock 2016	Ineligible patient population
Hassanzadeh 2010	Ineligible patient population
Hatcher 2015	Ineligible patient population
Hazell 2009	Ineligible patient population
Hesse 2010	Ineligible patient population
Hewage 2018	Ineligible patient population
Hirayasu 2009	Ineligible intervention
Holder 2017	Ineligible patient population
Hooley 2018	Ineligible patient population
Husain 2011	Ineligible patient population
Husain 2014	Ineligible patient population
Johansson 2010	Ineligible patient population
Kawanishi 2014	Ineligible patient population
Keefe 2016	Ineligible patient population
Keefe 2018	Ineligible patient population
Kellett 2014	Ineligible patient population
Keng 2018	Ineligible patient population
Kennard 2018	Ineligible patient population
Koenigsberg 2003	Ineligible intervention

Study	Reason for exclusion
Krause Utz 2016	Ineligible intervention
Krause Utz 2017	Ineligible intervention
Linehan 1999	Ineligible outcomes
Linehan 2002	Ineligible outcomes
Lorentzen 2013	Ineligible patient population
Maffei 2018	Ineligible patient population
Mahlke 2015	Ineligible intervention
Marasinghe 2012	Ineligible patient population
Marchesi 2006	Ineligible patient population
McAuliffe 2014	Ineligible patient population
Merolla 2017	Ineligible patient population
Moran 2010	Ineligible intervention
Munroe-Blum 1995	Ineligible outcomes
NCT01311193	Ineligible intervention
NCT02728778	Ineligible intervention
NCT03498937	Ineligible intervention
Nickel 2007a	Ineligible intervention
Nickel 2007b	Ineligible intervention
Nickel 2008	Ineligible intervention
NL1680/NTR1781	Ineligible comparator
NL5802/NTR5957	Ineligible intervention
O'Connor 2017	Ineligible patient population
Oquendo 2012	Ineligible patient population
Ougrin 2011	Ineligible patient population
Ower 2014	Ineligible intervention
Roberts 2018	Ineligible patient population
Rombold 2014	Ineligible patient population
Rosa 2009	Ineligible patient population

Study	Reason for exclusion
Roussignol 2010	Ineligible intervention
Santamarina Pérez 2017	Ineligible patient population
Schuiringa 2017	Ineligible patient population
Schuppert 2009	Proportion of participants with full BPD unclear; unable to retreive further information
Sharp 2015	Ineligible intervention
Thunnissen 2009	Ineligible patient population
Tufekcioglu 2015	Ineligible patient population
Tyrer 2003a	Ineligible patient population
Van Beek 2009	Ineligible patient population
Van Dijk 2019	Ineligible patient population
Van Spijker 2010	Ineligible patient population
Vidal 2013	Ineligible patient population
Vijayakumar 2011	Ineligible patient population
Waltz 2009	Ineligible intervention
Watzke 2012	Ineligible patient population
Weertman 2007	Ineligible patient population
Wilks 2018	Ineligible patient population
Wingenfeld 2013	Ineligible intervention
Wingenfeld 2014	Ineligible intervention
Wölwer 2001	Ineligible patient population

BPD: borderline personality disorder

Characteristics of studies awaiting classification *[ordered by study ID]*

Abdelkarim 2016

Methods	Not known
Participants	People with borderline personality disorder
Interventions	Parallel social media in combination with dialectical behaviour therapy (DBT)
Outcomes	Compliance to DBT; adverse effects

Abdelkarim 2016 *(Continued)*

Notes	Conference abstract - no publication yet to enable a definite decision

Akbari 2009

Methods	Randomised controlled trial
Participants	People with borderline personality disorder
Interventions	Combined cognitive behavioural therapy and pharmacotherapy
Outcomes	Depression; anger
Notes	Translation required. We will translate it for the next update of this review.

Cowperthwait 2017

Methods	Randomised controlled trial
Participants	Adolescents
Interventions	Outpatient dialectical behaviour
Outcomes	Depression; borderline personality disorder symptoms; emotion dysregulation symptoms; dialectical behaviour therapy skills use
Notes	Unable to retrieve paper through contacting the author and help of information retrieval experts

Dorrepaal 2012

Methods	Randomised controlled trial
Participants	People with complex post-traumatic stress disorder (PTSD) and severe comorbidity
Interventions	Psychoeducation and cognitive behavioural therapy
Outcomes	PTSD symptoms; stress
Notes	Subsample data concerning only people with borderline personality disorder is needed. Previous contact with the authors was unsuccessful. We will contact authors again at the next update of this review.

Ducasse 2018

Methods	Randomised controlled trial
Participants	Suicidal, adults
Interventions	Acceptance and commitment therapy

Ducasse 2018 *(Continued)*

Outcomes	Suicide severity; depressive symptomatology; psychological pain; anxiety; hopelessness; anger; quality of life, and therapeutic processes
Notes	Subsample concerning people with borderline personality disorder needed. We will contact authors at next update of this review.

Einy 2018

Methods	Randomised controlled trial
Participants	People with borderline personality disorder
Interventions	Mentalisation-based therapy and cognitive-analytical therapy
Outcomes	Insecure attachment; social inefficiency
Notes	Translation required. We will translate it for the update of this review.

Isaia 2017

Methods	Not known
Participants	People with borderline personality disorder
Interventions	Systems training for emotional predictability and problem-solving (STEPPS)
Outcomes	Borderline personality disorder symptomatology; emotion regulation skills
Notes	Unable to retrieve paper though contacting the author and help of information retrieval experts

Johnson 2017

Methods	Not known
Participants	People with borderline personality disorder
Interventions	Cognitive analytic therapy
Outcomes	Not known
Notes	Unable to retrieve paper though contacting the author and help of information retrieval experts

McCauley 2018

Methods	Randomised controlled trial
Participants	Adolescents at high risk of suicide

McCauley 2018 *(Continued)*

Interventions	Dialectical behaviour therapy
Outcomes	Suicide attempts; non-suicidal self-injury; self-harm
Notes	Subsample data consisting only of people with borderline personality disorder is needed. We will contact authors again at the next update of this review.

Ostermeier 2017

Methods	Not known
Participants	Borderline personality disorder
Interventions	Dialectical behaviour therapy
Outcomes	Not known
Notes	Unable to retrieve paper despite contacting the author twice

Santamarina 2017

Methods	Randomised controlled trial
Participants	Adolescents with suicidal behaviour
Interventions	Dialectical behaviour therapy
Outcomes	Self-harming behaviour (assessed by number of self-reported self-harm episodes); suicidal ideation (assessed with Suicidal Ideation Questionnaire); Clinical Global Impression (CGI) scale for suicide
Notes	Conference abstract - no subsequent reports identified for this study

CGI: Clinical Global Impression scale
DBT: dialectical behaviour therapy
PTSD: post-traumatic stress disorder
STEPPS: systems training for emotional predictability and problem-solving

Characteristics of ongoing studies *[ordered by study ID]*

ACTRN12610000100099

Study name	**Public title:** A randomised controlled trial of three forms of psychosocial early intervention for borderline personality disorder in youth **Scientific title:** MOBY: a randomised controlled trial (RCT) of specialised early intervention, with individual cognitive analytic therapy, specialised early intervention without individual psychotherapy, and standard youth mental health care for first-presentation borderline personality disorder in youth
Methods	Randomised controlled trial
Participants	**Inclusion criteria:**

ACTRN12610000100099 *(Continued)*

	1. Males and females 2. Aged 15 to 25 years 3. Diagnosed with of borderline personality disorder (BPD)
Interventions	1. Specialised early intervention service for BPD 2. Youth mental healthcare 3. Befriending
Outcomes	**Primary outcomes:** 1. Interpersonal problems, measured by the Inventory of Interpersonal Problems Circumplex Version (IIP-C) 2. Social adjustment, measured by the Social Adjustment Scale Self Report (SAS-SR)
Starting date	17 March 2011
Contact information	**Name:** Dr Andrew Chanen **Address:** Locked Bag 10, Parkville VIC 3052, Australia **E-mail:** achanen@unimelb.edu.au **Telephone:** +61393422800
Notes	None

ACTRN12612000951853

Study name	**Public title:** A clinical trial of mentalization based therapy treatment for borderline personality disorder **Scientific title:** Outcome effects of a mentalization based treatment service (mindsight) for people with borderline personality disorder in urban Christchurch: a clinical trial and evaluative study
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. People with BPD
Interventions	Individual psychotherapy session with a therapist trained in mentalisation-based treatment method
Outcomes	**Primary outcomes:** 1. Incident rate of self harm
Starting date	1 September 2009 (anticipated)
Contact information	**Name:** Dr David Carlyle **Address:** Department of Psychological Medicine, University of Otago, PO Box 4345, Christchurch 8011 **E-mail:** dave.carlyle@otago.ac.nz **Telephone:** +64 03 3720400

ACTRN12612000951853 *(Continued)*

Notes	None

ACTRN12612001187831

Study name	**Public title:** Exploring dialectical behaviour therapy vs conversational model in the treatment of borderline personality disorder: a randomised clinical trial **Scientific title:** Randomised clinical trial of dialectical behaviour therapy compared to conversational model in the treatment of borderline personality disorder in reducing parasuicidal behaviour and depression
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. People with BPD
Interventions	Dialectical behaviour therapy
Outcomes	Primary Outcome: Depression scores as measured by Beck Depression Inventory II (BDI-II) Primary Outcome: Secondary Outcome: Number and severity of BPD symptoms as measured by Borderline Personality Disorder Severity Index (BPDSI) Secondary Outcome: Interpersonal problems as measured by the Inventory of Interpersonal Problems (IIP) Secondary Outcome: Mindfulness skills as measured by the Kentucky Inventory of Mindfulness Scale (KIMS) Secondary Outcome: Dissociation as measured by the Dissociative Experiences Scale (DES) Secondary Outcome: Emotion regulation as measured by the Difficulties in Emotion Regulation Scale (DERS) Secondary Outcome: Sense of self as measured by the Sense of Self Inventory (SSI)
Starting date	12 April 2007 (anticipated)
Contact information	**Name:** Dr Carla Walton **Address:** Hunter New England Mental Health Service, PO Box 833, Newcastle NSW 2300, Australia **E-mail:** Carla.Walton@hnehealth.nsw.gov.au **Telephone:** + 61 2 4924 6820
Notes	None

ACTRN12616000236493

Study name	**Public title:** Effectiveness of dialectical behaviour therapy (DBT) group skills training for borderline personality disorder (BPD) in community mental health

ACTRN12616000236493 *(Continued)*	
	Scientific title: same as public title
Methods	Not known
Participants	**Inclusion criteria:** 1. BPD
Interventions	Dialectical Behaviour Therapy (DBT) Group Skills Training
Outcomes	**Primary outcomes:** 1. Borderline-related symptomology
Starting date	13 January 2015
Contact information	**Name:** Ms Brooke Packham **Address:** c/o Bordertown Community Health, PO Box 196, Bordertown SA 5268, Australia **E-mail:** brooke.packham@sa.gov.au **Telephone:** + 61887211507
Notes	None

DRKS00003605	
Study name	**Title:** Short-term psychotherapeutic treatment in adolescents engaging in non-suicidal self-injury: a randomised controlled trial
Methods	Not known
Participants	**Inclusion criteria:** 1. Participants aged between 12 and 17 years 2. Participants who name nonsuicidal self-injury in terms of snags and burn injuries and similar injuries in at least 5 cases in the last 6 months by means of a structured clinical interview. The last nonsuicidal self-injury should not date back longer than a month.
Interventions	The used short-term treatment programme called “The Cutting Down-Program” is a manualised short-term therapy, which is designed for 8 to 12 therapy sessions. It includes elements of the cognitive-behavioural therapy but also elements of the dialectic-behavioural therapy.
Outcomes	**Primary outcomes:** 1. Frequency of nonsuicidal self-injury, measured with the Self-Injurous Thoughts and Behaviours Interview-German (SITBI-G) at baseline (before therapy), post-line (directly after therapy), follow-up (6 months after therapy) and follow-up 2 (24-48 months after baseline)
Starting date	17 September 2010
Contact information	**Name:** Mr Dr Michael Kaess **Address:** Klinik für Kinder- und Jugendpsychiatrie Psychosoziales Zentrum Universitätsklinikum Heidelberg, Blumenstraße 8, 69115 Heidelberg, Germany **E-mail:** michael.kaess at med.uni-heidelberg.de

DRKS00003605 *(Continued)*

	Telephone: 06221-566914
Notes	None

DRKS00011534

Study name	**Title:** PRO*BPD: Effectiveness of outpatient treatment PROgrammes for Borderline Personality Disorder: a comparison of schema therapy and dialectical behaviour therapy
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Emotionally unstable personality disorder
Interventions	Intensive outpatient treatment programme of schema-focused therapy with one individual and one group session per week for 1.5 years
Outcomes	**Primary outcomes:** 1. Change in BPD symptom severity, assessed with the mean score of the BPD Severity Index at 1-year follow-up
Starting date	26 November 2014
Contact information	**Name:** Ms Dr Med Eva Faßbinder **Address:** Klinik für Psychiatrie und Psychotherapie, Universität zu Lübeck, Ratzeburger Allee 160, 23538 Lübeck, Germany **E-mail:** eva.fassbinder at uksh.de **Telephone:** 0451-50098702
Notes	None

ISRCTN21802136

Study name	**Public title:** Coping with Unusual ExperienceS for 12-18 (CUES+) **Scientific title:** Coping with Unusual ExperienceS for 12-18 year olds (CUES+): a transdiagnostic randomised controlled trial of the effectiveness of cognitive therapy in reducing distress associated with unusual experiences in adolescent mental health services: study protocol for a randomised controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Presenting to local CAMHS 2. Current unusual experiences associated with distress (UED) 3. Aged 12-18 years 4. Available for the study duration 5. Sufficient English language ability to be able to complete assessment measures and therapy (with interpreter support if necessary)

ISRCTN21802136 *(Continued)*

Interventions	Therapy will consist of up to 16 sessions, given over 16 weeks, including individual cognitive behavioural therapy for psychosis adapted for adolescents, and 3-4 family support sessions. Family work comprises recognition and understanding of the child's difficulties, sharing the intervention plan, and troubleshooting any key family difficulties. Individual work focuses on developing a collaborative understanding of UEDs, together with skills in affect regulation, managing negative automatic thoughts, behavioural tests, dealing with social difficulties and adverse life events, recognising and compensating for cognitive biases and a section on taking the work forward and preventing future difficulties. Therapy is tailored to take account of the developmental stage and presenting issues of the child/young person. Therapy materials have been designed to be fun, interactive and engaging.
Outcomes	**Primary outcomes:** 1. Distress at 16 weeks, assessed using the Emotional Problems subscale of the child reported version of the Strengths and Difficulties Questionnaire (SDQ)
Starting date	5 January 2015
Contact information	**Name:** Dr Suzanne Jolley **Address:** King's College London, Institute of Psychiatry, Department of Psychology (PO77), 16 De Crespigny Park, London SE5 8AF, United Kingdom **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT00603421

Study name	**Title:** Effectiveness of a 24 hour phone line on the rate of suicide attempts in people affected by borderline personality disorder
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Persons with Borderline Personality Disorder (male or female) 2. Aged 18 to 40 years
Interventions	One year of 1. Treatment-as-usual (TAU) + access to a 24 hour crisis phone line 2. TAU
Outcomes	**Primary outcomes:** 1. Rate of suicide attempts
Starting date	February 2009
Contact information	**Name:** Alexandra Pham-Scottez; Daniel Guelfi **Address:** Hôpital St. Anne, Paris, France 75014 **E-mail:** a.pham@ch-sainte-anne.fr; jd.guelfi@ch-sainte-anne.fr **Telephone:** not provided

NCT00603421 *(Continued)*

Notes	None

NCT01531634

Study name	**Title:** Promoting recovery processes in women with borderline personality disorder using a dynamic cognitive intervention
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder 2. Women
Interventions	Behavioural: dynamic cognitive intervention group
Outcomes	**Primary outcomes:** 1. Change in Recovery Assessment Scale. Time frame: change from baseline in Recovery Assessment Scale at 12th meeting (6 up to 12 weeks)
Starting date	Not provided. First received 3 February 2012
Contact information	**Name:** Orly Tsabar, BOT **Address:** Tel Aviv University **E-mail:** orly.tsabar@gmail.com **Telephone:** 972-54-6852344
Notes	None

NCT01823120

Study name	**Public title:** Text message intervention to reduce repeat self-harm **Scientific title:** Text message intervention to reduce repeat self-harm in patients presenting to the emergency department
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. All patients 18 years and over, presenting to the ED with self-harm. All patients should have a mobile phone, be familiar with text messaging technology and be willing to take part in the study.
Interventions	Supportive and interactive text messages
Outcomes	Primary outcomes: 1. Repetition of self-harm 2. Change scores on the Suicide Behaviours Questionnaire from baseline

NCT01823120 *(Continued)*

Starting date	March 2015. Specific date not provided
Contact information	**Name:** Vincent IO Agyapong, MRCPsych MD **Address:** University of Dublin, Trinity College Dublin **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02068326

Study name	**Public title:** MBT in groups for adolescents with BPD or subthreshold BPD versus TAU - the M-GAB randomized controlled trial (M-GAB) **Scientific title:** Mentalization-based treatment in groups for adolescents with borderline personality disorder (BPD) or subthreshold BPD versus treatment-as-usual - the M-GAB randomised controlled trial (M-GAB)
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder
Interventions	Mentalisation-based treatment
Outcomes	**Primary outcomes:** 1. The Borderline Personality Feature Scale for Children (BPFS-C)
Starting date	September 2015. Specific date not provided
Contact information	**Name:** Erik Simonsen, PhD **Address:** Child and Adolescent Psychiatric Department, Region Zealand, Denmark **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02125942

Study name	**Public title:** Central meditation and imagery therapy for augmentation of borderline personality disorder treatment **Scientific title:** Pilot study of central meditation and imagery therapy for borderline personality disorder
Methods	Randomised controlled trial
Participants	**Inclusion criteria:**

NCT02125942 *(Continued)*

	1. Borderline personality disorder
Interventions	Central meditation and imagery therapy
Outcomes	**Primary outcomes:** 1. Borderline Symptoms List
Starting date	April 2014
Contact information	**Name:** Felipe Jain, Clinical Instructor of Psychiatry **Address:** University of California, Los Angeles **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02126787

Study name	**Public title:** Short-term, intensive psychodynamic group therapy versus cognitive-behavioral group therapy in the day treatment **Scientific title:** Short-term, intensive psychodynamic group therapy versus cognitive-behavioral group therapy in the day treatment of anxiety disorders and comorbid depressive or personality disorders
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Anxiety disorders 2. Depressive disorders 3. Personality disorders
Interventions	Intensive group analytic psychotherapy
Outcomes	Primary outcomes: 1. Depression 2. Anxiety
Starting date	September 2014. Specific date not provided
Contact information	**Name:** Andrzej Kokoszka, MD, PhD **Address:** Hospital of Wola, Warsaw, Poland, 01-211 **E-mail:** andrzej.kokoszka@wum.edu.pl **Telephone:** +48603128361
Notes	None

NCT02134223

Study name	**Public title:** Methylation status of BDNF gene after dialectical behavior therapy in BPD **Scientific title:** Changes in methylation status of BDNF gene after receiving dialectical behavior therapy in patients with borderline personality disorder
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder
Interventions	Dialectical behaviour therapy
Outcomes	**Primary outcomes:** 1. Borderline Symptom Checklist (BSL-23)
Starting date	April 2014. Specific date not provided
Contact information	**Name:** Shu-I Wu **Address:** Mackay Memorial Hospital, Taipei, Taiwan **E-mail:** shuiwu624@gmail.com **Telephone:** +886-2-88094661 ext 3055
Notes	None

NCT02387736

Study name	**Public title:** DBT for chronically self-harming individuals with BPD: evaluating the clinical & cost effectiveness of a 6 mo treatment (FASTER-DBT) **Scientific title:** Dialectical behaviour therapy for chronically self-harming individuals with BPD: evaluating the clinical and cost effectiveness of a 6-month treatment
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder
Interventions	Dialectical behaviour therapy - 6 months
Outcomes	**Primary outcomes:** 1. Change in frequency and severity of suicide and self-harm behaviours over time, as measured by the Suicide Attempt Self-Injury Interview (SASII)
Starting date	February 2015. Specific date not provided
Contact information	**Name:** Shelly McMain **Address:** Centre for Addiction and Mental Health, 60 White Squirrel Way, Toronto, ON M6J 1H4, Canada

NCT02387736 *(Continued)*

	E-mail: not provided **Telephone:** not provided
Notes	None

NCT02517723

Study name	**Public title:** Narrative exposure therapy in women with borderline personality disorder and post-traumatic stress disorder **Scientific title:** A randomized controlled clinical trial (RCCT) to test the effectiveness of narrative exposure therapy (NET) versus dialectical-behavioral therapy in reducing trauma related symptoms in women suffering from borderline personality disorder (BPD) and post-traumatic stress disorder (PTSD)
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder 2. Stress disorders, post-traumatic
Interventions	1. Behavioural: narrative exposure therapy 2. Behavioural: dialectical behaviour therapy 3. Behavioural: standard inpatient care
Outcomes	**Primary outcomes:** 1. Change from first investigation in post-traumatic symptom severity at 18 months (Clinician-Administered PTSD Scale; CAPS)
Starting date	April 2014. Specific date not provided
Contact information	**Name:** Professor, Dr Med Martin Driessen; Evangelisches Krankenhaus Bielefeld **Address:** Clinic of Psychiatry, Evangelisches Krankenhaus Bielefeld, Bielefeld, Germany 33617 **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02685943

Study name	**Public title:** A randomised trial for suicidal patients **Scientific title:** 'Collaborative assessment and management of suicidality' (CAMS) in comparison to 'Treatment-as-usual' (TAU) for suicidal patients: a randomized controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Suicidal Ideation

NCT02685943 *(Continued)*

	2. Attempted Suicide 3. Suicide
Interventions	Psychotherapy
Outcomes	**Primary outcomes:** 1. Changes in scores on Beck's Scale for Suicide Ideation (BSSI)
Starting date	April 2015. Specific date not provided
Contact information	**Name:** Dr Roar Fosse **Address:** Vestre Viken Helseforetak, Drammen, Norway, 3004 **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02771691

Study name	**Public title:** Mentalization-based group therapy for adolescents **Scientific title:** Efficacy of mentalization-based group therapy for adolescents: a pilot randomised controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Deliberate self-harm
Interventions	Mentalisation-based group therapy for adolescents
Outcomes	**Primary outcomes:** 1. Self-harm as measured by the self-harm subscale of the Risk-taking and Self-harm Inventory for Adolescents (Vrouva 2010) 2. Self-harm and related hospital use as reported in National Health Service patient records
Starting date	February 2016. Specific date not provided
Contact information	**Name:** not provided **Address:** CAMHS, Edinburgh, Lothian, United Kingdom **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02985047

Study name	**Public title:** Brief admission Skåne: replacing general admission for individuals with self-harm and acute risk of suicide (BAS) **Scientific title:** Brief admission Skåne: can brief admission replace general admission for individuals with self-harm and acute risk of suicide
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Self-injurious behaviour 2. Suicidal ideation 3. Suicide, attempted 4. Borderline personality disorder 5. Emergency services, psychiatric
Interventions	Brief admission
Outcomes	**Primary outcomes:** 1. Number of days with hospital admission
Starting date	1 September 2015
Contact information	**Name:** Sofie Westling, MD, PhD **Address:** Division of Psychiatry, Region Skåne, Lund, Skåne, Sweden, 22185 **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT02991586

Study name	**Public title:** Effectiveness study of a dialectical behavioral treatment for families of adolescents with emotional instability (FAL) **Scientific title:** Effectiveness study of a dialectical behavioral treatment for families of adolescents with emotional instability
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Emotional instability
Interventions	Dialectical behaviour therapy
Outcomes	**Primary outcomes:** 1. Difficulties in Emotional Regulation Scale (DERS) 2. Automatic Anger and Hostility Thoughts Scale (IPRI) 3. Coping Styles and Strategies Scale (COPE)

NCT02991586 *(Continued)*

Starting date	May 2016. Specific date not provided
Contact information	**Name:** María Mayoral, Clinical Psychologist **Address:** Instituto Provincial de Psiquiatria, Hospital General Universitario Gregorio Maranon. Calle Ibiza 43, Madrid, Spain, 28009 **E-mail:** maria.mayoral@iisgm.com **Telephone:** +34 914265005
Notes	None

NCT03011190

Study name	**Public title:** Effectiveness of the iconic therapy for borderline personality disorder symptoms **Scientific title:** Effectiveness of the iconic therapy in youth with suicidal ideation/self-injuring behavior and borderline personality traits: study protocol for a randomized controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Personality disorder, borderline
Interventions	Emotional regulation
Outcomes	**Primary outcomes:** 1. Change on the severity of borderline personality disorder measured by Borderline Personality Symptom List (BSL-23). Time frame: baseline and up to 12 months after inclusion
Starting date	September 2015. Specific date not provided
Contact information	**Name:** Silvia Elisa Hurtado Santiago, Principal investigator **Address:** University of Malaga, Malaga, Spain 29190 **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT03092271

Study name	**Public title:** Randomised trial of stepped care for suicide prevention in teens and young adults (Step2Health) **Scientific title:** Randomized trial of stepped care for suicide prevention in teens and young adults
Methods	Randomised controlled trial
Participants	**Inclusion criteria:**

NCT03092271 *(Continued)*

	1. Suicidal behaviour 2. Self-harm, deliberate 3. Suicidal ideation 4. Suicide
Interventions	Behavioural: stepped care for suicide prevention Behavioural: zero suicide quality improvement
Outcomes	**Primary outcomes:** 1. Suicide attempt behaviour
Starting date	3 April 2017
Contact information	**Name:** Dr Joan R Asarnow **Address:** University of California Los Angeles (UCLA), Los Angeles, California, United States, 90095-6968 **E-mail:** jasarnow@mednet.ucla.edu **Telephone:** 310 825-0408
Notes	None

NCT03185026

Study name	**Public title:** Psychoeducation for suicidal behavior (PEPSUI) **Scientific title:** Effectiveness of the first French psychoeducational program for suicidal behavior: a randomized controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Suicide, attempted 2. Suicidal behaviour
Interventions	PEPSUI psychoeducational programme
Outcomes	**Primary outcomes:** 1. Suicide re-attempt rate reduction, assessed using the Columbia Suicide Severity Rating Scale (C-SSRS)
Starting date	1 July 2017 (estimated)
Contact information	**Name:** Déborah DUCASSE, MD **Address:** University Hospital, Montpellier **E-mail:** d-ducasse@chu-montpellier.fr **Telephone:** 00 33 4 67 33 82 89
Notes	None

NCT03191565

Study name	**Public title:** Using smartphones for self-monitoring of skill-use in dialectical behavior therapy (mDIARY) **Scientific title:** The mDIARY study: using smartphones for daily self-monitoring of skill-use and outcome in dialectical behavior therapy with borderline personality disorder: a combined RCT and time series study
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder 2. Emotional instability 3. Skill, coping
Interventions	Monsenso dialectical behaviour therapy (DBT)-app and IT monitoring programme
Outcomes	**Primary outcomes:** 1. Mean number of days required to learn a new DBT-skill
Starting date	15 June 2017
Contact information	**Name:** Stig Helweg-Jørgensen PhD **Address:** Region of Southern Denmark, Denmark **E-mail:** not provided **Telephone:** not provided
Notes	None

NCT03297840

Study name	**Public title:** Change in mindfulness in borderline personality disorder **Scientific title:** Change in mindfulness in borderline personality disorder after dialectic-behavioural therapy (DBT): a pre-post-comparison
Methods	Registry stated "current observational study" (quote)
Participants	**Inclusion criteria:** 1. Mindfulness 2. Borderline personality disorder
Interventions	Dialectical behavioural therapy (DBT)
Outcomes	**Primary outcomes:** 1. Change in mindfulness 2. Change in borderline symptom severity 3. Change in overall psychiatric symptom severity

NCT03297840 *(Continued)*

	4. Change in severity in symptoms of depression
Starting date	4 May 2017
Contact information	**Name:** Katharina Bachmann, Psych Msc **Address:** Department of Psychiatry and Psychotherapy - University Hospital, University of Oldenburg, Bad Zwischenahn, Germany, 26160 **E-mail:** Katharina.Bachmann@uni-oldenburg.de **Telephone:** 00494119615 1506
Notes	None

NCT03376113

Study name	**Title:** The effect of a brief psychological intervention on reducing self-harm repetition: feasibility study
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Suicide 2. Self-harm
Interventions	The volitional help sheet
Outcomes	**Primary outcomes:** 1. Acceptability of the intervention to patients 2. Feasibility of intervention delivery at the ER setting 3. Patient recruitment 4. Proportion of participating patients who can be reached by telephone contact at the 3-month follow-up 5. Proportion of participating patients who can be reached by telephone contact at the 6-month follow-up 6. Proportion of participating patients who can be traced from the hospital record at the 3-month follow-up 7. Proportion of participating patients who can be traced from the hospital record at the 6-month follow-up 8. Proportion of participating patients whose identity card number can be linked to the nationwide self-harm registry at the 6-month follow-up 9. Proportion of participating patients whose identity card number can be linked to the nationwide self-harm registry at the 3-month follow-up 10. Change in scores on a self-report suicidal behaviours assessment from baseline to 3 months 11. Change in scores on a self-report suicidal behaviours assessment from baseline to 6 months 12. Number of repeat self-harm episodes per person in 3 months after intervention based on hospital records 13. Number of repeat self-harm episodes per person in 3 months after intervention recorded in the nationwide self-harm registry 14. Number of repeat self-harm episodes per person in 6 months after intervention based on hospital records 15. Number of repeat self-harm episodes per person in 6 months after intervention recorded in the nationwide self-harm registry

NCT03376113 *(Continued)*	
	16.Time to next self-harm repetition (in days) following randomisation
Starting date	3 November 2017
Contact information	**Name:** Shu-Sen Chang, MD, MSc, PhD **Address:** National Taiwan University Hospital, Taipei, Taiwan, 100 **E-mail:** shusenchang@ntu.edu.tw **Telephone:** +886 2 33668062
Notes	None

NCT03418142	
Study name	**Public title:** Evaluating an Internet-based self-management intervention for borderline (REVISIT) **Scientific title:** Research evaluating the effectiVeness of adding an Internet-based self-management intervention to usual care in the treatment of borderline personality disorder - REVISIT BPD
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Borderline personality disorder
Interventions	Internet-based self-management intervention for borderline personality disorder (REVISIT)
Outcomes	**Primary outcomes:** 1. Score of the Borderline Personality Disorder Severity Index (BPDSI)
Starting date	29 January 2018
Contact information	**Name:** Andrea Hauer **Address:** Gaia AG Hamburg, Germany, 20144 **E-mail:** andrea.hauer@gaia-group.com **Telephone:** +4940349930382
Notes	None

NCT03677037	
Study name	**Public title:** The short-term MBT project (MBT-RCT) **Scientific title:** Short-term versus long-term mentalization-based therapy for outpatients with subthreshold or diagnosed borderline personality disorder: a randomized clinical trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:**

NCT03677037 *(Continued)*

	1. Borderline personality disorder
Interventions	1. Other: short-term MBT 2. Other: long-term MBT
Outcomes	**Primary outcomes:** 1. Change in severity of borderline personality disorder, assessed with the Zanarini Rating Scale for Borderline Personality Disorder (ZAN-BPD) interview
Starting date	24 September 2018
Contact information	**Name:** Sophie Juul Msc **Address:** Stolpegaard Psychotherapy Centre, Mental Health Services, Capital Region of Denmark, Gentofte, Denmark, 2820 **E-mail:** sophie.juul@regionh.dk **Telephone:** 004538645324
Notes	None

NCT03833453

Study name	**Public title:** Effectiveness of PTSD-treatment compared to integrated PTSD-PD-treatment in adult patients with comorbid PTSD and BPD (PROSPER-B) **Scientific title:** Prediction and outcome study in PTSD and (borderline) personality disorders
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Post-traumatic stress disorder (PTSD) 2. Borderline personality disorder (BPD)
Interventions	behavioural: dialectical behaviour therapy
Outcomes	**Primary outcomes:** 1. CAPS-5 (Clinician Administered PTSD Scale). Time frame: 12 months
Starting date	1 June 2018
Contact information	**Name:** Aishah Snoek, MSc **Address:** Sinai Centrum, Amstelveen, Noord-Holand, Netherlands, 1180EB **E-mail:** aishah.snoek@sinaicentrum.nl **Telephone:** 0031-20-5457200
Notes	None

NL1144/NTR1186

Study name	**Public title:** SFT for forensic PD patients **Scientific title:** Efficacy of schema-focused therapy (SFT) versus usual treatment in forensic patients with personality disorders: a three-year randomised clinical trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Forensic people with antisocial, borderline, narcissistic, or paranoid personality disorder
Interventions	Forensic setting, three years of individual SFT
Outcomes	**Primary outcomes:** 1. Severity of personality disorder symptoms 2. Risk of recidivism and violence **Secondary outcomes:** 1. Therapy process variables (e.g. therapeutic engagement, quality of the therapeutic alliance) 2. Changes in the psychological processes (i.e. early maladaptive schemas, schema modes) that are hypothesised to mediate changes in personality disorders in the SFT model
Starting date	1 October 2007
Contact information	**Name:** Professor David Bernstein **Address:** University of Maastricht, Departement of Clinical Psychological Science, PO Box 616, 6200 MD, Maastricht, The Netherlands **E-mail:** D.Bernstein@dmkep.unimaas.nl **Telephone:** +31 478 635 200
Notes	None

NL2168/NTR2292

Study name	**Public title:** Dosage-trial mentalisation-based treatment (MBT): intensive outpatient MBT versus day hospital MBT **Scientific title:** Intensive outpatient mentalisation-based treatment versus day hospital mentalisation-based treatment: a randomised controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Referral to the MBT-programme as implemented by De Viersprong 2. At least one personality disorder as diagnosed according to DSM-IV criteria
Interventions	The MBT-programme offers 18-month psychotherapy designed specifically for treatment refractory people with complex personality disorders, often complicated by multi-morbidity, who have typically had a history of unsuccessful treatments. Day hospital MBT (DH-MBT) consists of daily group psychotherapy, weekly individual psychotherapy, individual crisis planning from a mentalising perspective, art therapy twice a week, and writing therapy. Intensive outpatient MBT (IOP-MBT) con-

NL2168/NTR2292 *(Continued)*

	sists of group psychotherapy twice a week, weekly individual psychotherapy, and individual crisis planning from a mentalising perspective.
Outcomes	**Primary outcomes:** 1. Frequency and severity of manifestations of (borderline) personality disorder 2. Symptomatic functioning 3. Quality of life 4. Care consumption **Secondary outcomes:** 1. Axis I diagnoses 2. Interpersonal and personality functioning 3. Mentalisation 4. Treatment adherence
Starting date	8 February 2010
Contact information	**Name:** Helene Andrea **Address:** Viersprong Institute for Studies on Personality Disorders (VISPD), PO Box 7, 4660 AA Halsteren, The Netherlands **E-mail:** helene.andrea@deviersprong.nl **Telephone:** +31 (0)164 632200
Notes	None

NL2266/NTR2392

Study name	**Public title:** Group schema therapy for borderline personality disorder **Scientific title:** Multi-Site RCT of group schema therapy for borderline personality disorder
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Age 18-65 years 2. Primary DSM-IV diagnosis of BPD (assessed with the SCID-II interview) 3. BPD severity above 20 on the BPDSI interview
Interventions	1. 118 group schema therapy sessions over 2 years with maximum of 17 individual sessions 2. 64 group schema therapy over 2 years with maximum of 61 individual sessions 3. TAU - the standard treatment given for that patient at the treatment centre
Outcomes	**Primary outcomes:** 1. BPD severity index - mean score
Starting date	1 February 2010
Contact information	**Name:** Professor Arnoud Arntz **Address:** University Maastricht (UM), DMKEP, PO Box 616, 6200 MD Maastricht, The Netherlands

NL2266/NTR2392 *(Continued)*

	E-mail: Arnoud.Arntz@MP.Unimaas.nl **Telephone:** +31 (0)43 3881228
Notes	None

NL3856/NTR4016

Study name	**Public title:** Toetsing van een geïntegreerd behandelprotocol voor patiënten met een bipolaire stoornis en een comorbide borderline persoonlijkheidskenmerken. Een randomized clinical trial **Scientific title:** The addition of STEPPS in the treatment of people with bipolar disorder and co-morbid borderline personality features: a protocol for a randomised controlled trial
Methods	Randomised controlled trial
Participants	**Inclusion criteria:** 1. Age 18–65 years 2. Diagnosis of bipolar disorder-I, bipolar disorder-II, or bipolar disorder-not otherwise specified (NOS) 3. Comorbid borderline personality disorder or borderline personality features (at least 3 of 9 DSM-IV-TR criteria, including at least impulsivity and anger bursts).
Interventions	Investigational treatment of the study will be the STEPPS training added to individual TAU for bipolar disorder. The STEPPS training is a group treatment developed for people with BPD to improve their emotion regulation. The training consists of 20 weekly sessions of approximately 2.5 hours and consists of 4 parts: psychoeducation, emotion regulation skills, behavioural skills and emotion handling plan.
Outcomes	**Primary outcomes:** 1. Frequency and severity of manic and depressive episodes 2. Symptoms, course and burden of borderline personality features
Starting date	25 August 2013
Contact information	**Name:** G Riemann **Address:** Saxion Hogescholen Academie Mens en Arbeid Handelskade 75, 7417 DH Deventer, The Netherlands **E-mail:** g.riemann@saxion.nl **Telephone:** not provided
Notes	None

BAS: Brief Admission Skåne
BDI(-II): Beck Depression Inventory (-Revised)
IIBDNF: brain-derived neurotrophic factor
BPD: borderline personality disorder
BPDSI: Borderline Personality Severity Index
BPFS-C: Borderline Personality Features Scale for Children
BSL-23: Borderline Symptom List-23
BSSI: Beck Scale for Suicide Ideation
CAMHS: children and adolescents mental health services

CAMS: Cognitive and Affective Mindfulness Scale
CAPS(-5): Clinician-Administered PTSD Scale for DSM-5
COPE: Coping Orientation to Problems Experienced Inventory
C-SSRS: Columbia Suicide Severity Rating Scale
CUES+: Coping with Unusual Experiences for 12–18 year olds
DBT: dialectical behavior therapy
DERS: Developmental Environmental Rating Scale
DES: Dissociative Experiences Scale
DH: day hospital
DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition
DSM-IV-TR: Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision
ED: emergency department
ER: emergency room
FAL: families of adolescents with emotional instability
FASTER-DBT: the feasibility of a shorter treatment and evaluating responses for dialectical behavior therapy
IIP-C: Inventory of Interpersonal Problems Circumplex Scales
IOP: intensive outpatient
IPRI: Automatic Anger and Hostility Thoughts Scale
IT: information technology
KIMS: Kentucky Inventory of Mindfulness Skills
MBT: mentalisation-based treatment
mDIARY: using smartphones for self-monitoring of skill-use in dialectical behavior therapy
M-GAB: Mentalization-based treatment in Groups for Adolescence with Borderline personality disorder or subthreshold borderline personality disorder
MOBY: Monitoring Outcomes of Borderline personality disorder in Youth
NET: narrative exposure therapy
NOS: bipolar disorder-not otherwise specified
PD: personality disorder
PEPSUI: psychoeducation for suicidal behavior
PRO*BPD: PROgrams for Borderline Personality Disorder
PROSPER-B: Prediction and Outcome Study in PTSD and (Borderline) Personality disorders
PTSD: post-traumatic stress disorder
RCCT: Rogers' client centred therapy
RCT: randomised controlled trial
REVISIT: Research Ealuating the effectiVeness of adding an Internet-based Self-management Intervention to usual care in the Treatment of Borderline Personality disorder
SASII: Suicide Attempt Self-Injury Interview
SAS-SR: Social Adjustment Scale Self-Report
SCID-II: Structured Clinical Interview for DSM Axis II disorders
SDQ: Strengths and Difficulties Questionnaire
SFT: schema focused therapy
SITBI-G: Self-Injurious Thoughts and Behaviors Interview-German version
SSI: Scale for Suicidal Ideation
Step2Health: randomised trial of stepped care for suicide prevention in teens and young adults
STEPPS: systems training for emotional predictability and problem solving
TAU: treatment-as-usual
UED: Unusual Experiences associated with Distress
ZAN-BPD: Zanarini Rating Scale for Borderline Personality disorder

DATA AND ANALYSES

Comparison 1. Psychotherapy vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1 Primary: BPD symptom severity (continuous)	23		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.1.1 End of treatment	22	1244	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-0.70, -0.33]
1.1.2 0-6 months follow-up	2	41	Std. Mean Difference (IV, Random, 95% CI)	-0.59 [-1.23, 0.05]
1.1.3 6-12 months follow-up	2	157	Std. Mean Difference (IV, Random, 95% CI)	-0.04 [-0.36, 0.27]
1.1.4 12 months and over follow-up	2	97	Std. Mean Difference (IV, Random, 95% CI)	-0.94 [-2.58, 0.70]
1.2 Primary: BPD symptom severity (dichotomous), at above 12 months follow-up	1		Risk Ratio (IV, Fixed, 95% CI)	Subtotals only
1.3 Primary: self-harm (continuous)	13		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.3.1 End of treatment	13	616	Std. Mean Difference (IV, Random, 95% CI)	-0.32 [-0.49, -0.14]
1.3.2 0-6 months follow-up	1	28	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-1.28, 0.23]
1.3.3 6-12 months follow-up	3	174	Std. Mean Difference (IV, Random, 95% CI)	-0.18 [-0.48, 0.12]
1.4 Primary: self-harm (dichotomous)	6		Risk Ratio (IV, Random, 95% CI)	Subtotals only
1.4.1 End of treatment	6	513	Risk Ratio (IV, Random, 95% CI)	0.85 [0.63, 1.14]
1.4.2 0-6 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.14 [0.04, 0.56]
1.4.3 6-12 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.27 [0.10, 0.68]
1.4.4 12 months and over follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.33 [0.15, 0.76]
1.5 Primary: suicide-related outcomes (continuous)	13		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.5.1 End of treatment	13	666	Std. Mean Difference (IV, Random, 95% CI)	-0.34 [-0.57, -0.11]
1.5.2 0-6 months follow-up	2	36	Std. Mean Difference (IV, Random, 95% CI)	-0.43 [-1.10, 0.23]
1.5.3 6-12 months follow-up	2	109	Std. Mean Difference (IV, Random, 95% CI)	-0.42 [-0.80, -0.04]
1.5.4 Above 12 months follow-up	1	76	Std. Mean Difference (IV, Random, 95% CI)	-0.31 [-0.77, 0.14]

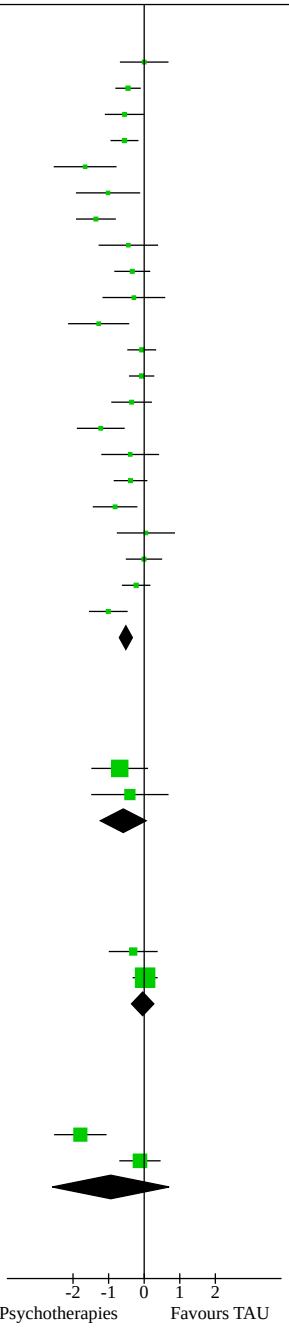
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.6 Primary: suicide-related outcomes (dichotomous)	5		Risk Ratio (IV, Random, 95% CI)	Subtotals only
1.6.1 End of treatment	5	396	Risk Ratio (IV, Random, 95% CI)	0.27 [0.11, 0.67]
1.6.2 0-6 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.25 [0.06, 1.05]
1.6.3 Above 12 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.29 [0.11, 0.74]
1.7 Primary: psychosocial functioning (continuous)	23		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.7.1 End of treatment	22	1314	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-0.68, -0.22]
1.7.2 0-6 months follow-up	1	9	Std. Mean Difference (IV, Random, 95% CI)	-1.23 [-2.74, 0.29]
1.7.3 6-12 months follow-up	3	247	Std. Mean Difference (IV, Random, 95% CI)	-0.09 [-0.40, 0.23]
1.7.4 Above 12 months follow-up	6	499	Std. Mean Difference (IV, Random, 95% CI)	-0.27 [-0.60, 0.05]
1.8 Secondary: anger (continuous)	8		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.8.1 End of treatment	8	323	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-0.64, -0.12]
1.8.2 0-6 months follow-up	1	8	Std. Mean Difference (IV, Random, 95% CI)	-1.20 [-2.82, 0.41]
1.8.3 6-12 months follow-up	2	111	Std. Mean Difference (IV, Random, 95% CI)	-0.12 [-0.50, 0.25]
1.8.4 Above 12 months follow-up	1	80	Std. Mean Difference (IV, Random, 95% CI)	0.02 [-0.42, 0.46]
1.9 Secondary: affective instability (continuous)	12		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.9.1 End of treatment	12	620	Std. Mean Difference (IV, Random, 95% CI)	-0.68 [-0.98, -0.39]
1.9.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-1.21, 0.18]
1.10 Secondary: chronic feelings of emptiness (continuous)	4		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.10.1 End of treatment	4	187	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.69, -0.10]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.10.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.58 [-1.28, 0.11]
1.11 Secondary: impulsivity (continuous)	10		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.11.1 End of treatment	10	491	Std. Mean Difference (IV, Random, 95% CI)	-0.54 [-0.84, -0.25]
1.11.2 6-12 months follow-up	2	77	Std. Mean Difference (IV, Random, 95% CI)	0.32 [-0.13, 0.77]
1.12 Secondary: impulsivity (dichotomous), at end of treatment	1		Risk Ratio (IV, Fixed, 95% CI)	Subtotals only
1.13 Secondary: interpersonal problems (continuous)	18		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.13.1 End of treatment	18	1159	Std. Mean Difference (IV, Random, 95% CI)	-0.42 [-0.68, -0.16]
1.13.2 0-6 months follow-up	1	53	Std. Mean Difference (IV, Random, 95% CI)	-0.41 [-1.01, 0.20]
1.13.3 6-12 months follow-up	2	132	Std. Mean Difference (IV, Random, 95% CI)	-0.17 [-0.65, 0.32]
1.13.4 Above 12 months follow-up	3	172	Std. Mean Difference (IV, Random, 95% CI)	0.00 [-0.54, 0.54]
1.14 Secondary: abandonment (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.14.1 End of treatment	2	84	Std. Mean Difference (IV, Random, 95% CI)	-0.22 [-0.66, 0.21]
1.14.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-1.08, 0.30]
1.15 Secondary: identity disturbance (continuous)	4		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.15.1 End of treatment	4	250	Std. Mean Difference (IV, Random, 95% CI)	-0.37 [-0.84, 0.10]
1.15.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-1.09 [-1.83, -0.35]
1.16 Secondary: dissociation and psychotic-like symptoms (continuous)	6		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.16.1 End of treatment	6	244	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-0.85, -0.10]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.16.2 0-6 months follow-up	2	35	Std. Mean Difference (IV, Random, 95% CI)	-0.97 [-1.69, -0.26]
1.16.3 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.59 [-1.29, 0.11]
1.16.4 12 months and over follow-up	1	24	Std. Mean Difference (IV, Random, 95% CI)	-0.01 [-0.81, 0.79]
1.17 Secondary: depression (continuous)	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
1.17.1 End of treatment	22	1568	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.61, -0.17]
1.17.2 0-6 months follow-up	4	125	Std. Mean Difference (IV, Random, 95% CI)	-0.80 [-1.26, -0.34]
1.17.3 6-12 months follow-up	3	260	Std. Mean Difference (IV, Random, 95% CI)	-0.40 [-0.95, 0.16]
1.17.4 12 months and over follow-up	5	311	Std. Mean Difference (IV, Random, 95% CI)	-0.40 [-0.74, -0.06]
1.18 Secondary: depression (dichotomous), at end of treatment	1		Risk Ratio (IV, Fixed, 95% CI)	Subtotals only
1.19 Secondary: attrition (dichotomous)	33		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
1.19.1 End of treatment	32	2225	Risk Ratio (M-H, Random, 95% CI)	1.00 [0.83, 1.20]
1.19.2 0-6 months follow-up	1	60	Risk Ratio (M-H, Random, 95% CI)	0.58 [0.34, 1.00]
1.20 Secondary: non-serious adverse effects (dichotomous), at end of treatment	2	381	Risk Ratio (M-H, Random, 95% CI)	0.92 [0.45, 1.88]
1.21 Secondary: serious adverse effects (dichotomous), at end of treatment	4	571	Risk Ratio (IV, Fixed, 95% CI)	0.86 [0.14, 5.09]

Analysis 1.1. Comparison 1: Psychotherapy vs TAU, Outcome 1: Primary: BPD symptom severity (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.1.1 End of treatment								
Amianto 2011 (1)	3.3	1	16	3.3	1.1	17	3.9%	0.00 [-0.68 , 0.68]
Blum 2008 (2)	9.8	8.0623	65	13.4	7.6811	59	6.5%	-0.45 [-0.81 , -0.10]
Bos 2010 (3)	79.7	25.8	26	95.1	29.1	26	4.8%	-0.55 [-1.11 , 0.00]
Doering 2010 (4)	4.79	1.54	52	5.63	1.47	52	6.2%	-0.55 [-0.95 , -0.16]
Farrell 2009 (5)	18.81	9.47	16	32.75	5.9	12	2.9%	-1.66 [-2.54 , -0.78]
Gratz 2006 (6)	25.83	5.72	12	34.7	10.81	10	2.8%	-1.02 [-1.92 , -0.11]
Gratz 2014 (6)	27.47	6.59	31	35.88	5.59	30	4.8%	-1.36 [-1.92 , -0.80]
Gregory 2008b (6)	33.6	12.4	10	38.4	8.62	13	3.1%	-0.44 [-1.28 , 0.39]
Jørgensen 2013 (7)	2.8	2.5	42	3.6	2.1	24	5.2%	-0.33 [-0.84 , 0.17]
Koons 2001a (8)	3.6	1.6	10	4.2	2.3	10	2.9%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (7)	1.17	1.17	14	4.25	3.2	12	3.0%	-1.28 [-2.14 , -0.42]
Laurenssen 2018 (9)	20.63	11.45	54	21.39	10.43	41	6.1%	-0.07 [-0.47 , 0.34]
Leichsenring 2016 (10)	18.76	8.6	64	19.41	9.38	58	6.5%	-0.07 [-0.43 , 0.28]
Leppänen 2016 (11)	17.54	10.14	19	21.48	11.41	32	4.7%	-0.35 [-0.93 , 0.22]
Morton 2012 (12)	32.76	12.47	21	47.42	11	20	4.0%	-1.22 [-1.89 , -0.55]
Philips 2018 (13)	17	9.1	13	20.7	9.1	11	3.2%	-0.39 [-1.20 , 0.42]
Priebe 2012 (14)	13.1	6.9	33	15.9	7.5	37	5.5%	-0.38 [-0.86 , 0.09]
Reneses 2013 (15)	13	7.9	18	19.1	6.9	26	4.3%	-0.82 [-1.45 , -0.19]
Robinson 2016 (16)	9.64	7.41	12	9.27	7.39	11	3.2%	0.05 [-0.77 , 0.87]
Rossouw 2012b (17)	2.79	0.5385	29	3.06	65.7267	30	5.2%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (18)	13.29	9.53	48	15.39	9	49	6.1%	-0.22 [-0.62 , 0.17]
Soler 2009 (19)	3.5	1.2	29	4.44	0.52	30	4.9%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**634**			**610**	**100.0%**	**-0.52 [-0.70 , -0.33]**
Heterogeneity: Tau² = 0.10; Chi² = 48.68, df = 21 (P = 0.0006); I² = 57%								
Test for overall effect: Z = 5.51 (P < 0.00001)								
1.1.2 0-6 months follow-up								
Kredlow 2017a (20)	2.86	2.7	14	4.88	3	12	65.0%	-0.69 [-1.49 , 0.11]
Robinson 2016 (16)	7.1	6.19	10	10	7.97	5	35.0%	-0.40 [-1.49 , 0.68]
Subtotal (95% CI)			**24**			**17**	**100.0%**	**-0.59 [-1.23 , 0.05]**
Heterogeneity: Tau² = 0.00; Chi² = 0.17, df = 1 (P = 0.68); I² = 0%								
Test for overall effect: Z = 1.79 (P = 0.07)								
1.1.3 6-12 months follow-up								
Amianto 2011 (21)	3.1	1	16	3.4	0.9	17	20.8%	-0.31 [-1.00 , 0.38]
Blum 2008 (22)	33	18.5432	65	32.4	26.1159	59	79.2%	0.03 [-0.33 , 0.38]
Subtotal (95% CI)			**81**			**76**	**100.0%**	**-0.04 [-0.36 , 0.27]**
Heterogeneity: Tau² = 0.00; Chi² = 0.72, df = 1 (P = 0.40); I² = 0%								
Test for overall effect: Z = 0.27 (P = 0.79)								
1.1.4 12 months and over follow-up								
Bateman 1999 (23)	5.5	5.2	22	15.1	5.3	19	49.0%	-1.79 [-2.53 , -1.06]
Jørgensen 2013 (7)	2.2	2.4	40	2.5	2.7	16	51.0%	-0.12 [-0.70 , 0.46]
Subtotal (95% CI)			**62**			**35**	**100.0%**	**-0.94 [-2.58 , 0.70]**
Heterogeneity: Tau² = 1.29; Chi² = 12.25, df = 1 (P = 0.0005); I² = 92%								
Test for overall effect: Z = 1.12 (P = 0.26)								



Footnotes

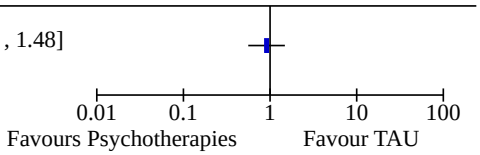
(1) Clinician rated: CGI-BPD
(2) Zan-BPD - total (CR)
(3) Self reported: BPD-40
(4) Clinician-rated: Mean number of DSM-IV BPD criteria met
(5) Self rated: BSI
(6) BEST (SR)
(7) SCID-BPD (CR)
(8) SCID-II - mean number of BPD criteria met (CR)
(9) BPDSI-IV (CR)
(10) Self rated: Borderline Personality Inventory

Analysis 1.1. (Continued)

(9) BPDSI-IV (CR)
(10) Self rated: Borderline Personality Inventory
(11) Clinician-rated: BPDSI-IV
(12) Self rated: BEST
(13) BPDSI-IV-total (CR)
(14) ZAN-BPD total (CR)
(15) Clinician rated: ZAN-BPD
(16) Zan-BPD-total (CR)
(17) BPFS-C (SR)
(18) BPDSI-IV total
(19) CCGI-BPD global (CR)
(20) Observer-rated: SCID-II BPD
(21) Clinician-rated: CGI-BPD
(22) BEST - total (CR)
(23) Clinician-rated: ZAN-BPD total

Analysis 1.2. Comparison 1: Psychotherapy vs TAU, Outcome 2: Primary: BPD symptom severity (dichotomous), at above 12 months follow-up

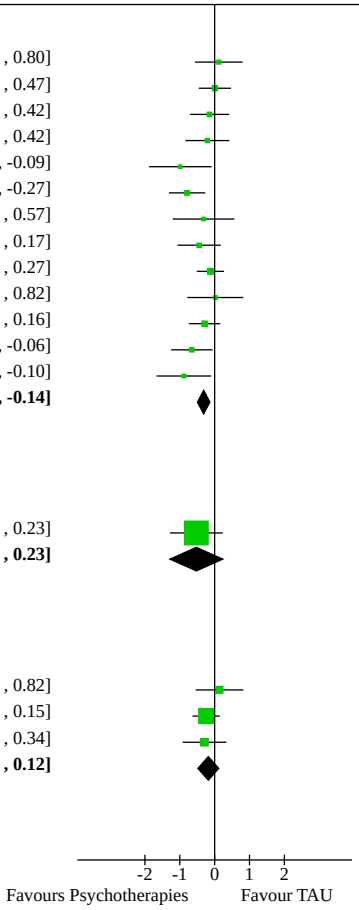
Study or Subgroup	Psychotherapies Events	Total	TAU Events	Total	Risk Ratio IV, Fixed, 95% CI	Risk Ratio IV, Fixed, 95% CI
Davidson 2006 (1)	19	43	16	33	0.91 [0.56 , 1.48]	
Test for subgroup differences: Not applicable						



Footnotes
(1) Participants still meeting BPD diagnostic criteria

Analysis 1.3. Comparison 1: Psychotherapy vs TAU, Outcome 3: Primary: self-harm (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.3.1 End of treatment								
Amianto 2011 (1)	2.2	2.8	16	1.9	2	17	6.0%	0.12 [-0.56 , 0.80]
Borschmann 2013 (2)	20.6	89.71	36	20	55.6	36	11.5%	0.01 [-0.45 , 0.47]
Carter 2010 (3)	5.2	7.47	20	8.42	26.92	31	8.4%	-0.15 [-0.71 , 0.42]
Feigenbaum 2012 (4)	2.4	3.2	25	3.1	3.4	16	6.9%	-0.21 [-0.84 , 0.42]
Gratz 2006 (5)	2.05	0.93	12	4.48	3.39	10	3.7%	-0.98 [-1.88 , -0.09]
Gratz 2014 (5)	0.69	0.35	31	0.97	0.35	30	9.4%	-0.79 [-1.31 , -0.27]
Koons 2001a (6)	0.4	1.3	10	1	2.2	10	3.8%	-0.32 [-1.20 , 0.57]
Linehan 1991 (7)	0.55	0.94	20	9.33	26.95	21	7.1%	-0.45 [-1.07 , 0.17]
Linehan 2006 (4)	14.17	37.63	52	18.94	40.73	49	14.7%	-0.12 [-0.51 , 0.27]
Philips 2018 (8)	2.3	5.5	13	2.2	4.8	11	4.5%	0.02 [-0.78 , 0.82]
Priebe 2012 (9)	39.2	73.4	38	63.7	92.9	38	11.9%	-0.29 [-0.74 , 0.16]
Van den Bosch 2005 (10)	3.31	13.15	22	41.6	78.76	24	7.6%	-0.65 [-1.25 , -0.06]
Weinberg 2006 (11)	0.6	0.91	15	3.63	4.8	13	4.7%	-0.88 [-1.67 , -0.10]
Subtotal (95% CI)			**310**			**306**	**100.0%**	**-0.32 [-0.49 , -0.14]**
Heterogeneity: Tau² = 0.02; Chi² = 14.23, df = 12 (P = 0.29); I² = 16%								
Test for overall effect: Z = 3.46 (P = 0.0005)								
1.3.2 0-6 months follow-up								
Weinberg 2006 (11)	1.98	3.57	15	6.69	12.23	13	100.0%	-0.52 [-1.28 , 0.23]
Subtotal (95% CI)			**15**			**13**	**100.0%**	**-0.52 [-1.28 , 0.23]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.36 (P = 0.17)								
1.3.3 6-12 months follow-up								
Amianto 2011 (1)	0.4	0.8	16	0.3	0.6	17	19.1%	0.14 [-0.55 , 0.82]
Linehan 2006 (12)	5.43	6.19	52	15.93	60.96	49	58.2%	-0.24 [-0.64 , 0.15]
Van den Bosch 2005 (13)	10.9	34.28	18	33.9	99.39	22	22.7%	-0.29 [-0.92 , 0.34]
Subtotal (95% CI)			**86**			**88**	**100.0%**	**-0.18 [-0.48 , 0.12]**
Heterogeneity: Tau² = 0.00; Chi² = 1.06, df = 2 (P = 0.59); I² = 0%								
Test for overall effect: Z = 1.19 (P = 0.23)								

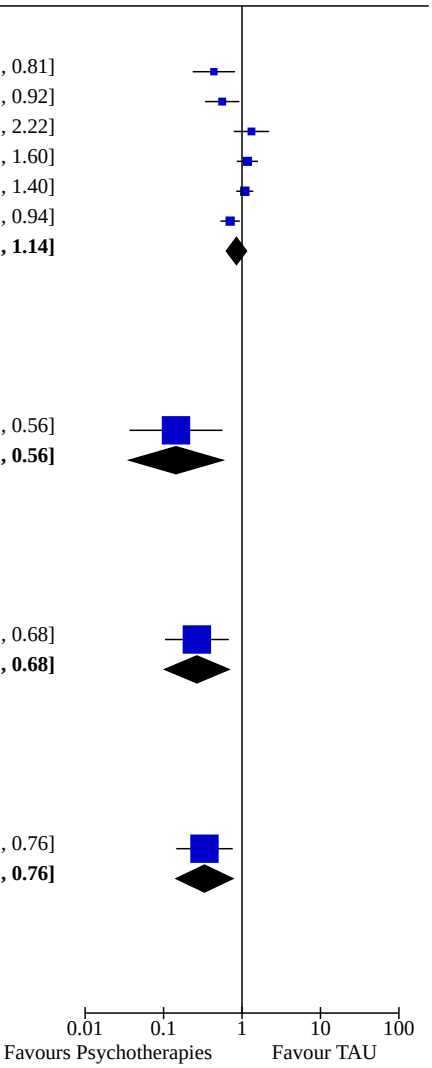


Footnotes

(1) self-harming incidents
(2) SHQ - number of suicidal and self-injurious episodes (past 6 months) (SR)
(3) number of self-harm episodes 3 to 6 months
(4) SASII - frequency of self-harm (CR)
(5) DSHI (SR)
(6) PHI - deliberate self-harm frequency (last 3 months) (CR)
(7) Mean number of parasuicidal acts (last 3 months)
(8) DSHI-SF (SR)
(9) Days of self-harm and type of deliberate self-harm recorded in an interview (CR)
(10) LPC - self-mutilation (last 3 months) (CR)
(11) PHI - deliberate self-harm frequency (CR)
(12) Observer-rated: SASII - NSSI
(13) LPC self-mutilation (last 3 months)

Analysis 1.4. Comparison 1: Psychotherapy vs TAU, Outcome 4: Primary: self-harm (dichotomous)

Study or Subgroup	Psychotherapies Events	Total	TAU Events	Total	Weight	Risk Ratio IV, Random, 95% CI
1.4.1 End of treatment						
Bateman 1999 (1)	7	19	16	19	11.8%	0.44 [0.24 , 0.81]
Bateman 2009 (1)	17	71	27	63	14.3%	0.56 [0.34 , 0.92]
Bos 2010 (2)	16	28	13	30	13.9%	1.32 [0.78 , 2.22]
Davidson 2006 (3)	35	52	27	47	19.3%	1.17 [0.86 , 1.60]
Doering 2010 (4)	38	52	35	52	20.8%	1.09 [0.84 , 1.40]
Rossouw 2012b	24	40	34	40	19.9%	0.71 [0.53 , 0.94]
Subtotal (95% CI)		**262**		**251**	**100.0%**	**0.85 [0.63 , 1.14]**
Total events:	137		152			
Heterogeneity: Tau² = 0.09; Chi² = 18.43, df = 5 (P = 0.002); I² = 73%						
Test for overall effect: Z = 1.09 (P = 0.28)						
1.4.2 0-6 months follow-up						
Bateman 1999 (1)	2	22	12	19	100.0%	0.14 [0.04 , 0.56]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.14 [0.04 , 0.56]**
Total events:	2		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.78 (P = 0.005)						
1.4.3 6-12 months follow-up						
Bateman 1999 (1)	4	22	13	19	100.0%	0.27 [0.10 , 0.68]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.27 [0.10 , 0.68]**
Total events:	4		13			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.77 (P = 0.006)						
1.4.4 12 months and over follow-up						
Bateman 1999 (1)	5	22	13	19	100.0%	0.33 [0.15 , 0.76]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.33 [0.15 , 0.76]**
Total events:	5		13			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.61 (P = 0.009)						

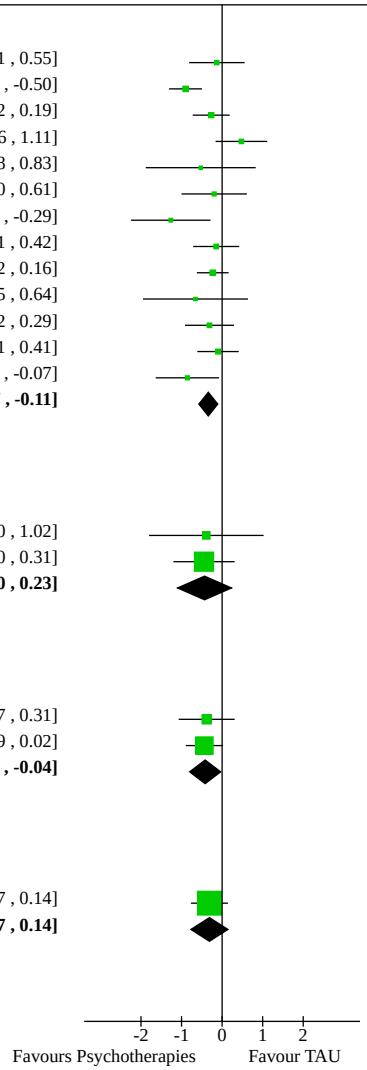


Footnotes

(1) SSHI - number of participants with self-mutilating behaviour (last 6 months) (CR)
(2) participants scoring above BPDSI-IV-parasuicide cut-off score
(3) DSHI - participants with self-harming behaviour (12 months of treatment) (SR)
(4) CISSB - participants with self-harming behaviour (last 12 months) (SR)

Analysis 1.5. Comparison 1: Psychotherapy vs TAU, Outcome 5: Primary: suicide-related outcomes (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.5.1 End of treatment								
Amianto 2011 (1)	1.4	0.7	16	1.5	0.8	17	7.3%	-0.13 [-0.81 , 0.55]
Andreoli 2016 (2)	0.35	0.6082	140	1	1.1	30	12.2%	-0.90 [-1.31 , -0.50]
Davidson 2006 (3)	0.69	1.14	43	1.22	2.67	33	11.1%	-0.27 [-0.72 , 0.19]
Feigenbaum 2012 (4)	0.24	0.43	25	0.06	0.25	16	7.9%	0.48 [-0.16 , 1.11]
Gleeson 2012 (5)	0.8	1	4	2.2	3	5	2.6%	-0.53 [-1.88 , 0.83]
Gregory 2008b (6)	0.32	0.64	11	0.44	0.55	13	5.8%	-0.20 [-1.00 , 0.61]
Koons 2001a (7)	26.2	8	10	41.5	14.3	10	4.4%	-1.26 [-2.24 , -0.29]
Leppänen 2016 (8)	0.41	0.49	19	0.51	0.76	32	9.0%	-0.15 [-0.71 , 0.42]
Linehan 2006 (4)	0.98	1.46	52	1.37	1.87	49	12.5%	-0.23 [-0.62 , 0.16]
Mehlum 2014 (9)	26.5	6.3	5	41.7	28.9	5	2.8%	-0.66 [-1.95 , 0.64]
Reneses 2013 (10)	0.9	1.2	18	1.3	1.3	26	8.4%	-0.31 [-0.92 , 0.29]
Soler 2009 (11)	2.44	1.24	29	2.55	0.88	30	10.0%	-0.10 [-0.61 , 0.41]
Weinberg 2006 (12)	27.47	16.92	15	42.69	17.67	13	6.1%	-0.86 [-1.64 , -0.07]
Subtotal (95% CI)			**387**			**279**	**100.0%**	**-0.34 [-0.57 , -0.11]**
Heterogeneity: Tau² = 0.07; Chi² = 21.22, df = 12 (P = 0.05); I² = 43%								
Test for overall effect: Z = 2.87 (P = 0.004)								
1.5.2 0-6 months follow-up								
Gleeson 2012 (5)	0.3	0.5	4	0.8	1.5	4	22.2%	-0.39 [-1.80 , 1.02]
Weinberg 2006 (12)	37.96	18.68	15	45.69	14.38	13	77.8%	-0.45 [-1.20 , 0.31]
Subtotal (95% CI)			**19**			**17**	**100.0%**	**-0.43 [-1.10 , 0.23]**
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.94); I² = 0%								
Test for overall effect: Z = 1.28 (P = 0.20)								
1.5.3 6-12 months follow-up								
Amianto 2011 (13)	1.4	0.6	16	1.7	0.9	17	30.7%	-0.38 [-1.07 , 0.31]
Davidson 2006 (14)	0.93	1.58	43	2.09	3.58	33	69.3%	-0.44 [-0.89 , 0.02]
Subtotal (95% CI)			**59**			**50**	**100.0%**	**-0.42 [-0.80 , -0.04]**
Heterogeneity: Tau² = 0.00; Chi² = 0.02, df = 1 (P = 0.90); I² = 0%								
Test for overall effect: Z = 2.15 (P = 0.03)								
1.5.4 Above 12 months follow-up								
Davidson 2006 (15)	1.88	3.19	43	3.03	4.16	33	100.0%	-0.31 [-0.77 , 0.14]
Subtotal (95% CI)			**43**			**33**	**100.0%**	**-0.31 [-0.77 , 0.14]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.34 (P = 0.18)								

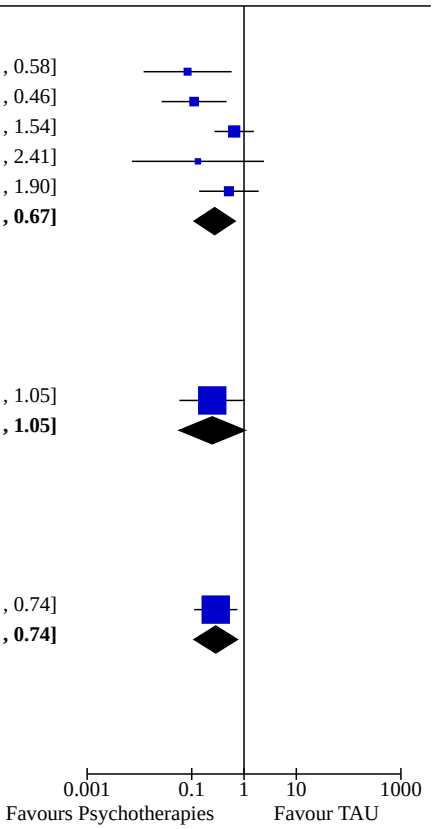


Footnotes

(1) CGI-BPD, suicidality and self-damaging acts (CR)
(2) Episode of suicidal ideation, with or without deliberate self-harm
(3) DSHI - cumulative number of suicide attempts
(4) SASII-suicide attempts (CR)
(5) OAS-M - suicidality (CR)
(6) LPC - parasuicides per last 3 months
(7) BSS (SR)
(8) BPDSI-IV - Parasuicidality, suicide plans and attempts (CR)
(9) SIQ-jr (SR)
(10) Clinician-rated: LSASI
(11) CGI-BPD, suicidality (CR)
(12) SBQ (SR)
(13) Clinician-rated: CGI-BPD, suicidality and self-damaging acts
(14) Number of suicide attempts (cumulative average at 12 months follow-up)
(15) Number of suicide attempts (cumulative average at 30 month follow-up)

Analysis 1.6. Comparison 1: Psychotherapy vs TAU, Outcome 6: Primary: suicide-related outcomes (dichotomous)

Study or Subgroup	Psychotherapies Events	Total	TAU Events	Total	Weight	Risk Ratio IV, Random, 95% CI
1.6.1 End of treatment						
Bateman 1999 (1)	1	19	12	19	14.7%	0.08 [0.01 , 0.58]
Bateman 2009 (1)	2	71	16	63	21.4%	0.11 [0.03 , 0.46]
Doering 2010 (2)	7	51	11	52	32.6%	0.65 [0.27 , 1.54]
Philips 2018 (3)	0	24	3	22	7.9%	0.13 [0.01 , 2.41]
Stanley 2017	3	37	6	38	23.4%	0.51 [0.14 , 1.90]
Subtotal (95% CI)		**202**		**194**	**100.0%**	**0.27 [0.11 , 0.67]**
Total events:	13		48			
Heterogeneity: Tau² = 0.45; Chi² = 7.30, df = 4 (P = 0.12); I² = 45%						
Test for overall effect: Z = 2.82 (P = 0.005)						
1.6.2 0-6 months follow-up						
Bateman 1999 (1)	2	22	7	19	100.0%	0.25 [0.06 , 1.05]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.25 [0.06 , 1.05]**
Total events:	2		7			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.90 (P = 0.06)						
1.6.3 Above 12 months follow-up						
Bateman 1999 (1)	4	22	12	19	100.0%	0.29 [0.11 , 0.74]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.29 [0.11 , 0.74]**
Total events:	4		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.57 (P = 0.01)						
Test for subgroup differences: Chi² = 0.03, df = 2 (P = 0.98), I² = 0%						



Footnotes

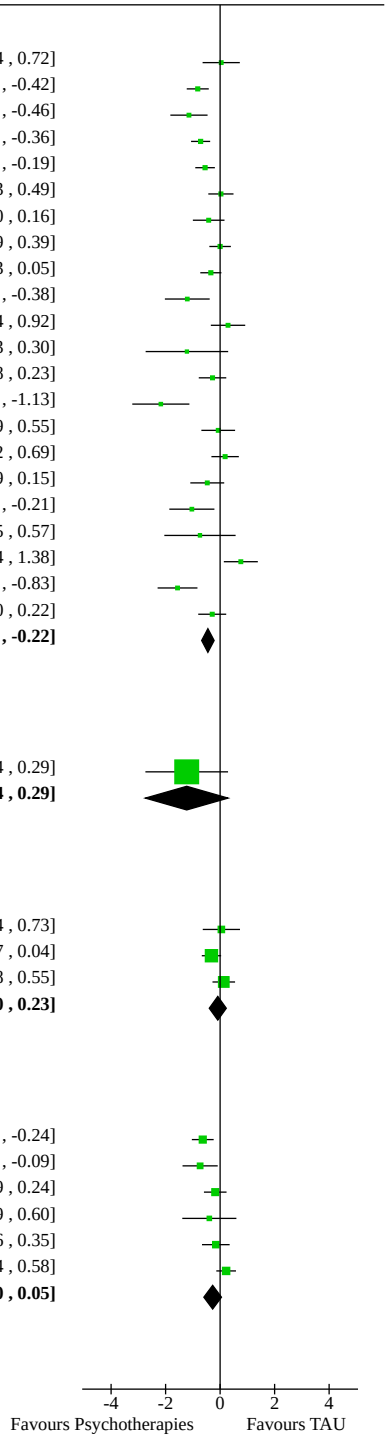
(1) SSHI - number of participants with life-threatening suicide attempts (last 6 months)

(2) CISSB - participants with suicide attempts (last 12 months) (SR)

(3) participants with suicide attempts (recorded via direct contact with patients and health care staff, as well as from reviewing the case records)

Analysis 1.7. Comparison 1: Psychotherapy vs TAU, Outcome 7: Primary: psychosocial functioning (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.7.1 End of treatment								
Amianto 2011 (1)	-65.9	11.2	16	-66.4	13	17	4.3%	0.04 [-0.64 , 0.72]
Andreoli 2016 (2)	-62.95	6.2343	140	-57.6	7.6	30	5.7%	-0.82 [-1.22 , -0.42]
Bateman 1999 (3)	2.7	0.6	20	3.4	0.6	19	4.3%	-1.14 [-1.83 , -0.46]
Bateman 2009 (3)	1.76	0.5	71	2.17	0.64	63	6.0%	-0.72 [-1.07 , -0.36]
Blum 2008 (4)	-50.5	12.9	65	-43.5	12.29	59	5.9%	-0.55 [-0.91 , -0.19]
Borschmann 2013 (5)	26.06	7.98	36	25.81	8.94	36	5.4%	0.03 [-0.43 , 0.49]
Carter 2010 (6)	8.15	11.48	20	13.07	11.59	28	4.8%	-0.42 [-1.00 , 0.16]
Davidson 2006 (7)	13.1	4.4	52	13.1	4.6	47	5.8%	0.00 [-0.39 , 0.39]
Doering 2010 (1)	-58.62	8.04	52	-56.06	6.87	52	5.8%	-0.34 [-0.73 , 0.05]
Farrell 2009 (1)	-60.5	10.17	16	-50.08	5.07	12	3.7%	-1.20 [-2.03 , -0.38]
Feigenbaum 2012 (8)	2.48	0.85	25	2.22	0.92	16	4.6%	0.29 [-0.34 , 0.92]
Gleeson 2012 (9)	-67	8.3	4	-50.6	14.1	5	1.7%	-1.22 [-2.73 , 0.30]
Gratz 2014 (10)	14.25	6.24	31	16.01	6.24	30	5.2%	-0.28 [-0.78 , 0.23]
Gregory 2008b (11)	-9.7	8.1	11	6.9	6.7	13	2.8%	-2.17 [-3.22 , -1.13]
Jochems 2015 (12)	12.8	6.36	16	13.22	5.8	27	4.6%	-0.07 [-0.69 , 0.55]
Jørgensen 2013 (3)	2.2	0.5	42	2.1	0.6	24	5.2%	0.18 [-0.32 , 0.69]
Kramer 2016 (13)	12.76	7.79	21	16	5.42	20	4.6%	-0.47 [-1.09 , 0.15]
Linehan 1994 (4)	-51.42	9.71	13	-40.43	10.8	13	3.6%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (14)	-59.4	6.6	5	-54.2	6.1	5	2.1%	-0.74 [-2.05 , 0.57]
Reneses 2013 (15)	35.4	8.9	18	27.6	10.8	26	4.6%	0.76 [0.14 , 1.38]
Salzer 2014 (16)	-65	9.84	17	-51.82	6.82	22	4.1%	-1.56 [-2.29 , -0.83]
Soler 2009 (17)	3.27	0.9	29	3.57	1.13	30	5.2%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**720**			**594**	**100.0%**	**-0.45 [-0.68 , -0.22]**
Heterogeneity: Tau² = 0.20; Chi² = 74.18, df = 21 (P < 0.00001); I² = 72%								
Test for overall effect: Z = 3.84 (P = 0.0001)								
1.7.2 0-6 months follow-up								
Gleeson 2012 (9)	-69.3	4.3	4	-53.5	14.7	5	100.0%	-1.23 [-2.74 , 0.29]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-1.23 [-2.74 , 0.29]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.58 (P = 0.11)								
1.7.3 6-12 months follow-up								
Amianto 2011 (1)	-65.6	13.4	16	-66.2	11.9	17	17.5%	0.05 [-0.64 , 0.73]
Blum 2008 (4)	-53	16.12	65	-47.1	20.74	59	45.2%	-0.32 [-0.67 , 0.04]
Davidson 2006 (7)	13	5	43	12.3	5.3	47	37.3%	0.13 [-0.28 , 0.55]
Subtotal (95% CI)			**124**			**123**	**100.0%**	**-0.09 [-0.40 , 0.23]**
Heterogeneity: Tau² = 0.02; Chi² = 2.85, df = 2 (P = 0.24); I² = 30%								
Test for overall effect: Z = 0.54 (P = 0.59)								
1.7.4 Above 12 months follow-up								
Andreoli 2016 (2)	-65.6	11.6	140	-58.1	12.3	30	20.3%	-0.64 [-1.04 , -0.24]
Bateman 1999 (1)	-58.3	10.5	22	-51.8	5.7	18	13.5%	-0.73 [-1.38 , -0.09]
Davidson 2006 (7)	10.3	5	43	11.2	5	47	19.8%	-0.18 [-0.59 , 0.24]
Gregory 2008b (11)	-14.3	8.7	8	-10.6	9	8	7.8%	-0.40 [-1.39 , 0.60]
Jørgensen 2013 (3)	2.1	0.5	40	2.2	0.8	24	17.1%	-0.16 [-0.66 , 0.35]
McMurran 2016 (18)	14.1	6.75	60	12.5	7.59	59	21.5%	0.22 [-0.14 , 0.58]
Subtotal (95% CI)			**313**			**186**	**100.0%**	**-0.27 [-0.60 , 0.05]**
Heterogeneity: Tau² = 0.09; Chi² = 12.57, df = 5 (P = 0.03); I² = 60%								
Test for overall effect: Z = 1.66 (P = 0.10)								



Footnotes

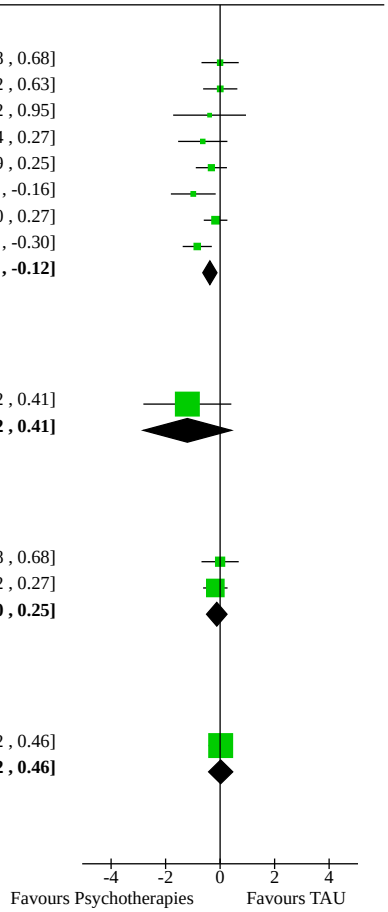
(1) Clinician-rated: GAF
(2) Clinician-rated: GAS
(3) SAS-SR (SR)
(4) GAS (CR)
(5) WSAS (SR)
(6) BDQ-days out of role (SR)

Analysis 1.7. (Continued)

(4) SAS (CR)
(5) WSAS (SR)
(6) BDQ-days out of role (SR)
(7) Self-rated: SFQ
(8) CORE-OM (SR)
(9) SOFAS (CR)
(10) Self-rated: SDS
(11) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(12) Clinician-rated: HoNOS
(13) OQ45, social role at discharge (SR)
(14) C-GAS (CR)
(15) Self-reported: SAS-SR (higher scores indicate poorer functioning)
(16) GAF (CR)
(17) CGI-global improvement, patient-rated (SR)
(18) SFQ (SR)

Analysis 1.8. Comparison 1: Psychotherapy vs TAU, Outcome 8: Secondary: anger (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.8.1 End of treatment								
Amianto 2011 (1)	2.6	1.1	16	2.6	1.4	17	11.7%	0.00 [-0.68 , 0.68]
Feigenbaum 2012 (2)	83.4	20.36	25	83.3	17.94	16	13.4%	0.01 [-0.62 , 0.63]
Gleeson 2012 (3)	13.3	5.4	4	15.2	3.4	5	3.6%	-0.39 [-1.72 , 0.95]
Koons 2001a (4)	14.5	3.9	10	17.9	6.1	10	7.3%	-0.64 [-1.54 , 0.27]
Leppänen 2016 (5)	0.8	1.3	19	1.27	1.52	32	15.5%	-0.32 [-0.89 , 0.25]
Linehan 1994 (6)	32.15	7.19	13	40.08	8.37	13	8.6%	-0.98 [-1.81 , -0.16]
Linehan 2006 (7)	1.84	0.51	48	1.93	0.57	36	22.7%	-0.17 [-0.60 , 0.27]
Soler 2009 (8)	3.11	1.02	29	3.88	0.78	30	17.1%	-0.84 [-1.37 , -0.30]
Subtotal (95% CI)			**164**			**159**	**100.0%**	**-0.38 [-0.64 , -0.12]**
Heterogeneity: Tau² = 0.03; Chi² = 8.82, df = 7 (P = 0.27); I² = 21%								
Test for overall effect: Z = 2.83 (P = 0.005)								
1.8.2 0-6 months follow-up								
Gleeson 2012 (3)	10	2.6	4	14.5	3.8	4	100.0%	-1.20 [-2.82 , 0.41]
Subtotal (95% CI)			**4**			**4**	**100.0%**	**-1.20 [-2.82 , 0.41]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.46 (P = 0.14)								
1.8.3 6-12 months follow-up								
Amianto 2011 (9)	2.4	1.3	16	2.4	1.3	17	30.1%	0.00 [-0.68 , 0.68]
Linehan 2006 (7)	1.89	0.53	44	1.99	0.61	34	69.9%	-0.17 [-0.62 , 0.27]
Subtotal (95% CI)			**60**			**51**	**100.0%**	**-0.12 [-0.50 , 0.25]**
Heterogeneity: Tau² = 0.00; Chi² = 0.18, df = 1 (P = 0.67); I² = 0%								
Test for overall effect: Z = 0.64 (P = 0.52)								
1.8.4 Above 12 months follow-up								
Linehan 2006 (7)	1.9	0.43	45	1.89	0.52	35	100.0%	0.02 [-0.42 , 0.46]
Subtotal (95% CI)			**45**			**35**	**100.0%**	**0.02 [-0.42 , 0.46]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.09 (P = 0.93)								

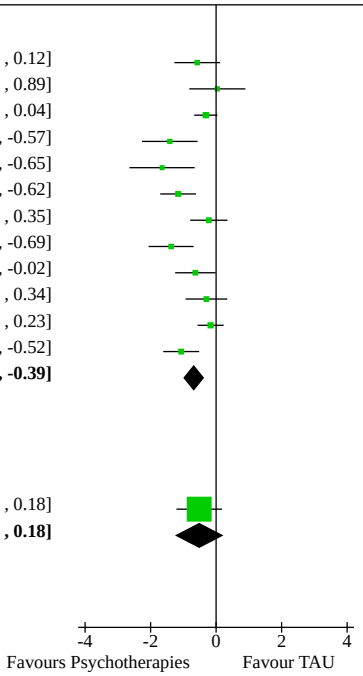


Footnotes

(1) Clinician-rated: CGI-BPD – anger reaction
(2) STAXI - anger out (geometric mean after log transformation) (SR)
(3) AIAQ - labile anger (SR)
(4) STAXI - anger out (SR)
(5) Clinician-rated: BPDSI-IV, anger
(6) STAXI, anger trait (SR)
(7) STAXI-anger out (SR)
(8) CGI-BPD, anger (CR)
(9) Clinician-rated: CGI-BPD

Analysis 1.9. Comparison 1: Psychotherapy vs TAU, Outcome 9: Secondary: affective instability (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.9.1 End of treatment								
Amianto 2011 (1)	2.2	0.9	16	2.9	1.4	17	7.7%	-0.58 [-1.28 , 0.12]
Bianchini 2019 (2)	65.6	9.4	10	65.1	15.57	11	6.3%	0.04 [-0.82 , 0.89]
Blum 2008 (3)	3.9	3.2249	65	4.9	3.0725	59	11.4%	-0.32 [-0.67 , 0.04]
Farrell 2009 (4)	5.88	3.44	16	9.83	1.12	12	6.3%	-1.41 [-2.26 , -0.57]
Gratz 2006 (5)	79.75	23.97	12	115.8	16.74	10	5.3%	-1.65 [-2.65 , -0.65]
Gratz 2014 (5)	95.27	15.6	31	113.62	15.6	30	9.3%	-1.16 [-1.71 , -0.62]
Leppänen 2016 (6)	5.65	2.83	19	6.26	2.65	32	9.0%	-0.22 [-0.79 , 0.35]
Morton 2012 (7)	113.04	17.64	21	140.04	20.88	20	7.8%	-1.37 [-2.06 , -0.69]
Reneses 2013 (8)	1.9	1.2	18	2.6	1	26	8.5%	-0.63 [-1.25 , -0.02]
Salzer 2014 (9)	4.71	3.35	17	5.55	2.26	22	8.3%	-0.30 [-0.93 , 0.34]
Schuppert 2012 (10)	3.88	2.37	48	4.29	2.48	49	10.9%	-0.17 [-0.57 , 0.23]
Soler 2009 (11)	3.61	1.19	29	4.66	0.7	30	9.2%	-1.07 [-1.61 , -0.52]
Subtotal (95% CI)			**302**			**318**	**100.0%**	**-0.68 [-0.98 , -0.39]**
Heterogeneity: Tau² = 0.16; Chi² = 31.18, df = 11 (P = 0.001); I² = 65%								
Test for overall effect: Z = 4.60 (P < 0.00001)								
1.9.2 6-12 months follow-up								
Amianto 2011 (1)	2.1	1.1	16	2.8	1.5	17	100.0%	-0.52 [-1.21 , 0.18]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.52 [-1.21 , 0.18]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.46 (P = 0.15)								
Test for subgroup differences: Chi² = 0.19, df = 1 (P = 0.66), I² = 0%								

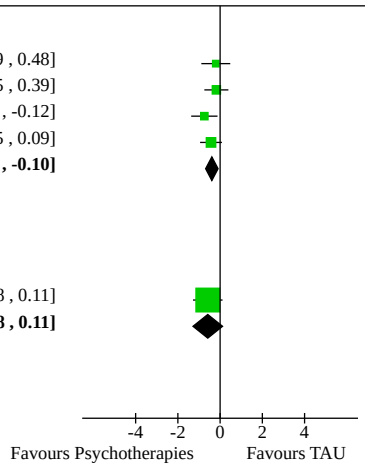


Footnotes

(1) Clinician-rated: CGI-BPD, affective instability
(2) DERS total score (SR)
(3) ZAN-BPD - affective instability (CR)
(4) Clinician-rated: DIB-R, affect
(5) DERS - total (SR)
(6) Clinician-rated: BPDSI-IV, affective instability
(7) Self-rated: DERS, emotion dysregulation
(8) Clinician-rated: ZAN-BPD, affective instability
(9) Strengths and Difficulties Questionnaire - emotional problems (SR)
(10) BPDS-IV - affective instability
(11) CGI-BPD, affective instability (CR)

Analysis 1.10. Comparison 1: Psychotherapy vs TAU, Outcome 10: Secondary: chronic feelings of emptiness (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.10.1 End of treatment								
Amianto 2011 (1)	2.6	1.1	16	2.8	0.8	17	18.5%	-0.20 [-0.89 , 0.48]
Leppänen 2016 (2)	3.55	3.24	19	4.14	3.31	32	26.8%	-0.18 [-0.75 , 0.39]
Reneses 2013 (3)	1.8	1.3	18	2.7	1.1	26	22.3%	-0.75 [-1.37 , -0.12]
Soler 2009 (4)	4.33	1.57	29	5	1.5	30	32.4%	-0.43 [-0.95 , 0.09]
Subtotal (95% CI)			**82**			**105**	**100.0%**	**-0.39 [-0.69 , -0.10]**
Heterogeneity: Tau² = 0.00; Chi² = 2.10, df = 3 (P = 0.55); I² = 0%								
Test for overall effect: Z = 2.61 (P = 0.009)								
1.10.2 6-12 months follow-up								
Amianto 2011 (5)	2.2	1.1	16	2.8	0.9	17	100.0%	-0.58 [-1.28 , 0.11]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.58 [-1.28 , 0.11]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.64 (P = 0.10)								

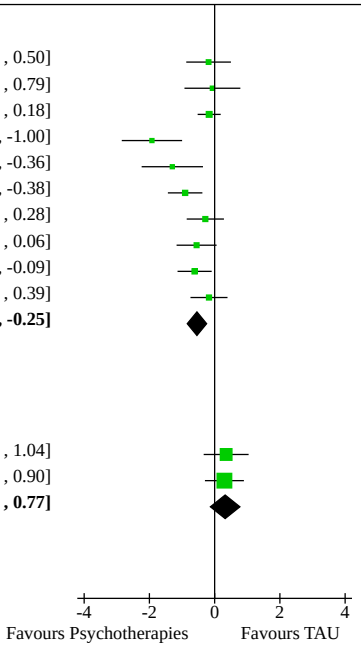


Footnotes

(1) Clinician-rated: CGI-BPD
(2) Clinician-rated: BPDSI-IV, emptiness
(3) Clinician rated: Zan-BPD, feeling of emptiness
(4) CGI-BPD, emptiness (CR)
(5) Clinician-rated: CGI-BPD, emptiness

Analysis 1.11. Comparison 1: Psychotherapy vs TAU, Outcome 11: Secondary: impulsivity (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.11.1 End of treatment								
Amianto 2011 (1)	1.8	1.1	16	2	1	17	9.3%	-0.19 [-0.87 , 0.50]
Bianchini 2019 (2)	50.66	10.7	10	51.75	18.42	11	7.3%	-0.07 [-0.93 , 0.79]
Blum 2008 (3)	1.9	2.4187	65	2.3	2.3043	59	14.7%	-0.17 [-0.52 , 0.18]
Farrell 2009 (4)	1.56	1.37	16	5.58	2.68	12	6.6%	-1.92 [-2.85 , -1.00]
Gratz 2006 (5)	10.92	3.85	12	17.1	5.34	10	6.5%	-1.30 [-2.24 , -0.36]
Gratz 2014 (5)	15.23	3.83	31	18.74	3.83	30	11.6%	-0.90 [-1.43 , -0.38]
Leppänen 2016 (6)	0.99	0.76	19	1.22	0.81	32	11.0%	-0.29 [-0.86 , 0.28]
Reneses 2013 (7)	1.6	1.3	18	2.3	1.2	26	10.3%	-0.55 [-1.17 , 0.06]
Soler 2009 (8)	3.61	0.97	29	4.11	0.6	30	11.7%	-0.61 [-1.14 , -0.09]
Van den Bosch 2005 (9)	0.92	0.74	23	1.06	0.84	25	11.0%	-0.17 [-0.74 , 0.39]
Subtotal (95% CI)			**239**			**252**	**100.0%**	**-0.54 [-0.84 , -0.25]**
Heterogeneity: Tau² = 0.12; Chi² = 21.18, df = 9 (P = 0.01); I² = 58%								
Test for overall effect: Z = 3.59 (P = 0.0003)								
1.11.2 6-12 months follow-up								
Amianto 2011 (10)	2.3	0.5	16	2.1	0.6	17	42.9%	0.35 [-0.34 , 1.04]
Van den Bosch 2005 (11)	1.08	0.93	20	0.85	0.57	24	57.1%	0.30 [-0.30 , 0.90]
Subtotal (95% CI)			**36**			**41**	**100.0%**	**0.32 [-0.13 , 0.77]**
Heterogeneity: Tau² = 0.00; Chi² = 0.01, df = 1 (P = 0.91); I² = 0%								
Test for overall effect: Z = 1.40 (P = 0.16)								

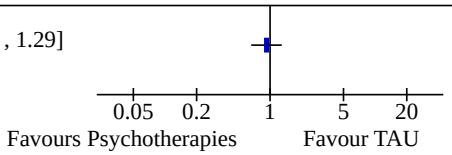


Footnotes

(1) Clinician-rated: CGI-BPD
(2) BIS-11 total score (SR)
(3) Zan-BPD - impulsivity subscale
(4) Clinician-rated: DIB-R, impulses
(5) DERS-impulse (SR)
(6) Clinician-rated: BPDSI-IV, impulsivity
(7) Clinician-rated: ZAN-BPD, impulsivity
(8) CGI-BPD - impulsivity (CR)
(9) BPDSI-IV - impulsivity (CR)
(10) Clinician-rated: CGI-BPD, impulsivity
(11) Observer rated: BPDSI-IV, impulsivity

Analysis 1.12. Comparison 1: Psychotherapy vs TAU, Outcome 12: Secondary: impulsivity (dichotomous), at end of treatment

Study or Subgroup	Psychotherapies Events	Total	TAU Events	Total	Risk Ratio IV, Fixed, 95% CI
Bos 2010 (1)	19	28	22	30	0.93 [0.66 , 1.29]
Test for subgroup differences: Not applicable					

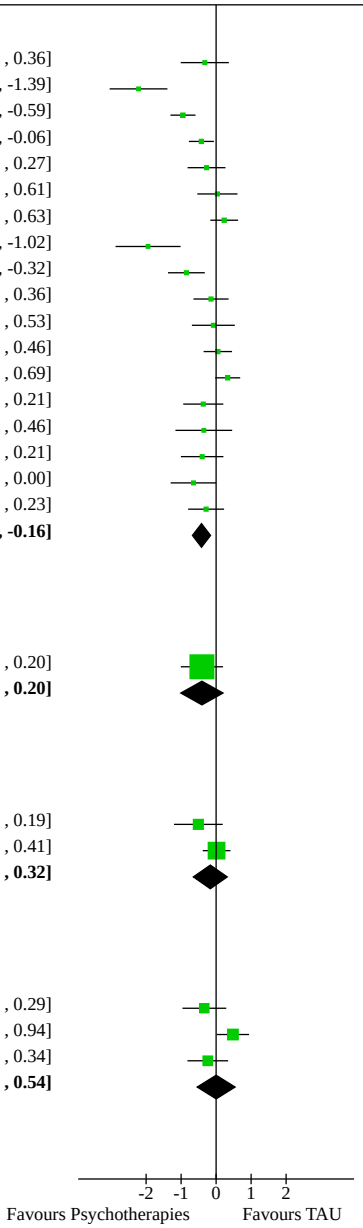


Footnotes

(1) participants scoring above BPDSI-IV-impulsivity cut-off score

Analysis 1.13. Comparison 1: Psychotherapy vs TAU, Outcome 13: Secondary: interpersonal problems (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.13.1 End of treatment								
Amianto 2011 (1)	2.4	1.1	16	2.8	1.3	17	4.9%	-0.32 [-1.01 , 0.36]
Bateman 1999 (2)	1.86	0.36	19	2.6	0.29	19	4.3%	-2.22 [-3.04 , -1.39]
Bateman 2009 (2)	1.28	0.13	71	1.65	0.55	63	6.6%	-0.95 [-1.30 , -0.59]
Blum 2008 (3)	2.2	2.4187	65	3.2	2.3043	59	6.6%	-0.42 [-0.78 , -0.06]
Bos 2010 (4)	-13	3.5	27	-12	3.7	26	5.7%	-0.27 [-0.81 , 0.27]
Carter 2010 (5)	-48.75	19.36	20	-49.73	30.23	28	5.5%	0.04 [-0.54 , 0.61]
Davidson 2006 (6)	60.4	23.9	52	55	22.3	47	6.4%	0.23 [-0.16 , 0.63]
Farrell 2009 (7)	4.88	4.02	16	12	2.8	12	3.8%	-1.94 [-2.87 , -1.02]
Gratz 2014 (8)	1.45	0.57	31	1.94	0.57	30	5.8%	-0.85 [-1.37 , -0.32]
Jørgensen 2013 (2)	1.2	0.6	42	1.3	0.8	24	5.9%	-0.15 [-0.65 , 0.36]
Kramer 2016 (9)	21.05	8.48	21	21.7	7.65	20	5.3%	-0.08 [-0.69 , 0.53]
Laurenssen 2018 (2)	2.78	0.63	54	2.75	0.57	41	6.4%	0.05 [-0.36 , 0.46]
Leichsenring 2016 (2)	13.21	4.49	64	11.57	5.37	58	6.6%	0.33 [-0.03 , 0.69]
Leppänen 2016 (10)	1.01	0.72	19	1.34	0.97	32	5.5%	-0.37 [-0.94 , 0.21]
Philips 2018 (2)	1.5	0.54	13	1.7	0.56	11	4.3%	-0.35 [-1.16 , 0.46]
Reneses 2013 (11)	1.9	1.1	18	2.3	0.9	26	5.3%	-0.40 [-1.01 , 0.21]
Salzer 2014 (12)	2.76	1.72	17	3.95	1.86	22	5.1%	-0.65 [-1.30 , 0.00]
Soler 2009 (13)	4.22	0.8	29	4.44	0.72	30	5.8%	-0.29 [-0.80 , 0.23]
Subtotal (95% CI)			**594**			**565**	**100.0%**	**-0.42 [-0.68 , -0.16]**
Heterogeneity: Tau² = 0.23; Chi² = 74.97, df = 17 (P < 0.00001); I² = 77%								
Test for overall effect: Z = 3.16 (P = 0.002)								
1.13.2 0-6 months follow-up								
Jørgensen 2013 (2)	1.2	0.7	38	1.5	0.8	15	100.0%	-0.41 [-1.01 , 0.20]
Subtotal (95% CI)			**38**			**15**	**100.0%**	**-0.41 [-1.01 , 0.20]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.32 (P = 0.19)								
1.13.3 6-12 months follow-up								
Amianto 2011 (14)	2.2	1.1	16	2.8	1.2	17	34.2%	-0.51 [-1.20 , 0.19]
Davidson 2006 (6)	54	23.9	52	53.7	24.1	47	65.8%	0.01 [-0.38 , 0.41]
Subtotal (95% CI)			**68**			**64**	**100.0%**	**-0.17 [-0.65 , 0.32]**
Heterogeneity: Tau² = 0.05; Chi² = 1.63, df = 1 (P = 0.20); I² = 39%								
Test for overall effect: Z = 0.67 (P = 0.50)								
1.13.4 Above 12 months follow-up								
Bateman 1999 (2)	1.5	4	21	2.5	0.5	19	30.4%	-0.34 [-0.96 , 0.29]
Davidson 2006 (6)	60.4	23.7	43	48.7	24.6	33	37.4%	0.48 [0.02 , 0.94]
Jørgensen 2013 (2)	1.2	0.8	40	1.4	0.9	16	32.2%	-0.24 [-0.82 , 0.34]
Subtotal (95% CI)			**104**			**68**	**100.0%**	**0.00 [-0.54 , 0.54]**
Heterogeneity: Tau² = 0.15; Chi² = 5.75, df = 2 (P = 0.06); I² = 65%								
Test for overall effect: Z = 0.00 (P = 1.00)								



Footnotes

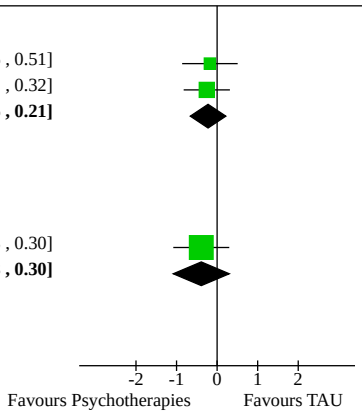
(1) Clinician-rated: CGI-BPD, disturbed relationships
(2) IIP-64 (SR)
(3) ZAN-BPD - disturbed relationships (CR)
(4) Self-reported: WHOQOL-Bref, social relationships
(5) Self-reported: WHOQOL-Bref social relationships
(6) IIP-32 (SR)
(7) Clinician-rated: DIB-R, interpersonal
(8) IIP-BPD (SR)
(9) OQ45.2 - interpersonal (SR)
(10) Clinician-rated: BPDSI-IV, unstable relationships
(11) Clinician-rated: ZAN-BPD, disturbed relationships
(12) Strengths and Difficulties Questionnaire - problems in relationships (SR)
(13) CGI-BPD, unstable relations (CR)
(14) Clinician rated: CGI-BPD, disturbed relationships

Analysis 1.13. (Continued)

(12) Strengths and Difficulties Questionnaire - problems in relationships (SR)
(13) CGI-BPD, unstable relations (CR)
(14) Clinician rated: CGI-BPD, disturbed relationships

Analysis 1.14. Comparison 1: Psychotherapy vs TAU, Outcome 14: Secondary: abandonment (continuous)

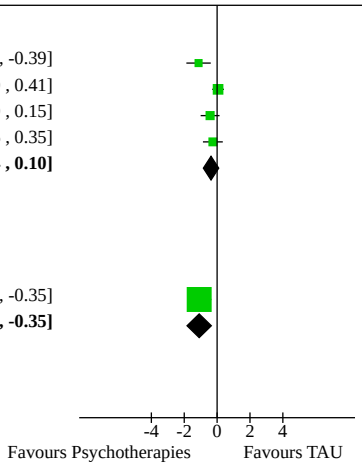
Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.14.1 End of treatment								
Amianto 2011 (1)	2.4	1.1	16	2.6	1.1	17	41.0%	-0.18 [-0.86 , 0.51]
Leppänen 2016 (2)	1.42	1.39	19	1.88	1.97	32	59.0%	-0.25 [-0.82 , 0.32]
Subtotal (95% CI)			**35**			**49**	**100.0%**	**-0.22 [-0.66 , 0.21]**
Heterogeneity: Tau² = 0.00; Chi² = 0.03, df = 1 (P = 0.87); I² = 0%								
Test for overall effect: Z = 1.00 (P = 0.32)								
1.14.2 6-12 months follow-up								
Amianto 2011 (3)	2.3	1	16	2.7	1	17	100.0%	-0.39 [-1.08 , 0.30]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.39 [-1.08 , 0.30]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.11 (P = 0.27)								



Footnotes
(1) Clinician-rated: CGI-BPD
(2) Clinician-rated: BPDSI-IV, abandonment
(3) Clinician-rated: CGI-BPD, fear of abandoment

Analysis 1.15. Comparison 1: Psychotherapy vs TAU, Outcome 15: Secondary: identity disturbance (continuous)

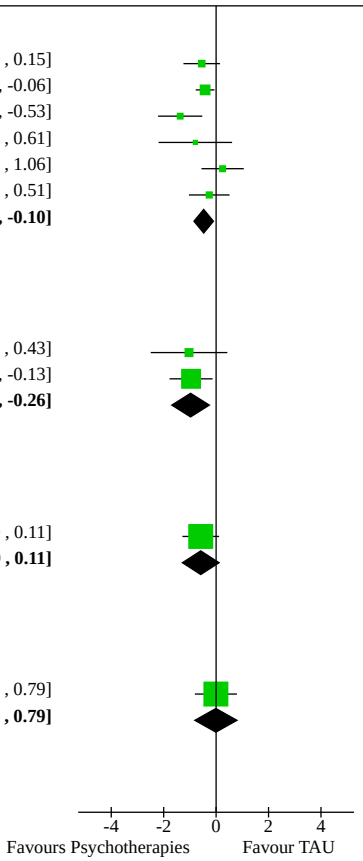
Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.15.1 End of treatment								
Amianto 2011 (1)	2.2	0.1	16	3.2	1.2	17	19.7%	-1.13 [-1.87 , -0.39]
Leichsenring 2016 (2)	4.45	2.9	64	4.28	2.91	58	32.0%	0.06 [-0.30 , 0.41]
Leppänen 2016 (3)	2.17	1.78	19	3.02	2.06	32	24.6%	-0.43 [-1.00 , 0.15]
Reneses 2013 (4)	2	1.2	18	2.3	1.1	26	23.7%	-0.26 [-0.86 , 0.35]
Subtotal (95% CI)			**117**			**133**	**100.0%**	**-0.37 [-0.84 , 0.10]**
Heterogeneity: Tau² = 0.14; Chi² = 8.61, df = 3 (P = 0.03); I² = 65%								
Test for overall effect: Z = 1.56 (P = 0.12)								
1.15.2 6-12 months follow-up								
Amianto 2011 (5)	2	1.2	16	3.4	1.3	17	100.0%	-1.09 [-1.83 , -0.35]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-1.09 [-1.83 , -0.35]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.90 (P = 0.004)								



Footnotes
(1) Clinician-rated: CGI-BPD identity distortion
(2) Self-reported: BPI
(3) Clinician-rated: BPDSI-IV, identity disturbance
(4) Clinician-rated: Zan-BPD, identity
(5) Clinician-rated: CGI-BPD, identity distortion

Analysis 1.16. Comparison 1: Psychotherapy vs TAU, Outcome 16: Secondary: dissociation and psychotic-like symptoms (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.16.1 End of treatment								
Amianto 2011 (1)	1.6	0.9	16	2.3	1.5	17	17.6%	-0.55 [-1.25 , 0.15]
Blum 2008 (2)	2	2.4187	65	3	2.3043	59	32.6%	-0.42 [-0.78 , -0.06]
Farrell 2009 (3)	1.69	2.02	16	4.25	1.49	12	13.7%	-1.37 [-2.21 , -0.53]
Gleeson 2012 (4)	43.5	6.5	4	49.6	7.1	5	6.1%	-0.79 [-2.19 , 0.61]
Gregory 2008b (5)	27.7	21.4	11	22.3	20.6	13	14.6%	0.25 [-0.56 , 1.06]
Kredlow 2017a (4)	39	8.7	14	41.3	8.3	12	15.4%	-0.26 [-1.04 , 0.51]
Subtotal (95% CI)			**126**			**118**	**100.0%**	**-0.47 [-0.85 , -0.10]**
Heterogeneity: Tau² = 0.08; Chi² = 8.01, df = 5 (P = 0.16); I² = 38%								
Test for overall effect: Z = 2.50 (P = 0.01)								
1.16.2 0-6 months follow-up								
Gleeson 2012 (4)	33.8	6.4	4	45.5	12.1	5	24.0%	-1.03 [-2.49 , 0.43]
Kredlow 2017a (6)	42	7.6	14	55.4	18.3	12	76.0%	-0.95 [-1.78 , -0.13]
Subtotal (95% CI)			**18**			**17**	**100.0%**	**-0.97 [-1.69 , -0.26]**
Heterogeneity: Tau² = 0.00; Chi² = 0.01, df = 1 (P = 0.93); I² = 0%								
Test for overall effect: Z = 2.67 (P = 0.008)								
1.16.3 6-12 months follow-up								
Amianto 2011 (7)	1.4	1	16	2.1	1.3	17	100.0%	-0.59 [-1.29 , 0.11]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.59 [-1.29 , 0.11]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.64 (P = 0.10)								
1.16.4 12 months and over follow-up								
Gregory 2008b (8)	28.4	28.9	11	28.6	18.7	13	100.0%	-0.01 [-0.81 , 0.79]
Subtotal (95% CI)			**11**			**13**	**100.0%**	**-0.01 [-0.81 , 0.79]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.02 (P = 0.98)								

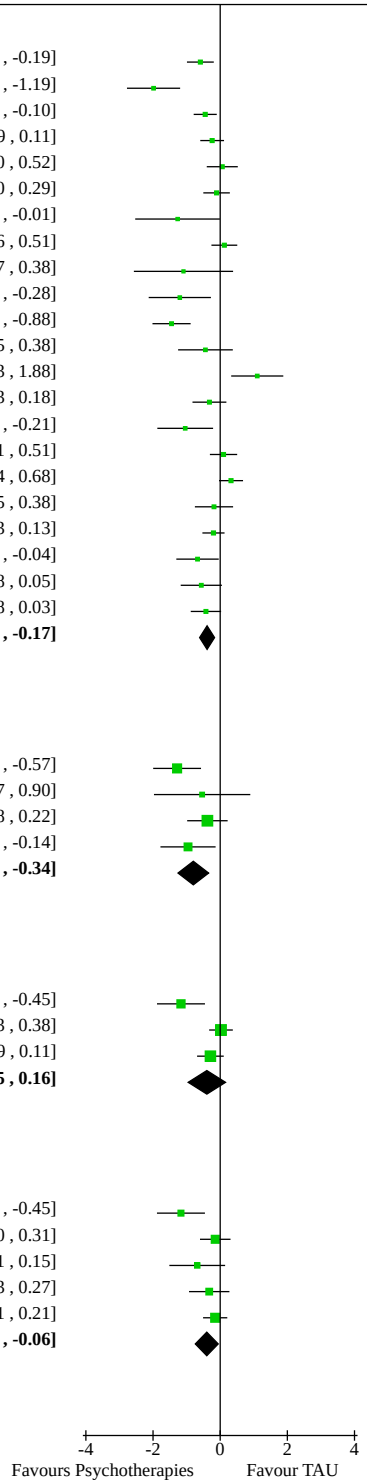


Footnotes

(1) Clinician-rated: CGI-BPD dissociative symptoms
(2) Clinical-rated: ZAN-BPD, cognitive subscale
(3) Clinician-rated: DIB-R cognition
(4) BPRS (CR)
(5) DES (SR)
(6) Observer-rated: BPRS, total
(7) Clinician-rated: CGI-BPD, dissociative symptoms
(8) Self-rated: DES

Analysis 1.17. Comparison 1: Psychotherapy vs TAU, Outcome 17: Secondary: depression (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
1.17.1 End of treatment								
Andreoli 2016 (1)	9.95	5.6912	140	13.4	6.4	30	5.5%	-0.59 [-0.99 , -0.19]
Bateman 1999 (2)	20.6	7	19	35.2	7.4	19	3.6%	-1.98 [-2.78 , -1.19]
Bateman 2009 (2)	14.8	8.55	71	18.68	8.76	63	5.8%	-0.45 [-0.79 , -0.10]
Blum 2008 (3)	22	16.1245	65	25.8	15.3623	59	5.7%	-0.24 [-0.59 , 0.11]
Borschmann 2013 (4)	10.47	3.54	36	10.2	4.96	36	5.2%	0.06 [-0.40 , 0.52]
Davidson 2006 (5)	29.6	14.8	52	31.3	16.6	47	5.5%	-0.11 [-0.50 , 0.29]
Davidson 2014 (6)	21.73	9.86	11	33.5	2.38	4	2.1%	-1.27 [-2.53 , -0.01]
Doering 2010 (2)	21.67	13.25	52	20.02	13.22	52	5.6%	0.12 [-0.26 , 0.51]
Gleeson 2012 (7)	12.3	8	4	22	7.8	5	1.7%	-1.09 [-2.57 , 0.38]
Gratz 2006 (8)	9	6.52	12	23.2	15.32	10	3.1%	-1.20 [-2.13 , -0.28]
Gratz 2014 (8)	13.04	5.63	31	21.3	5.63	30	4.7%	-1.45 [-2.02 , -0.88]
Gregory 2008b (9)	21	11.4	11	25.1	6.4	13	3.5%	-0.44 [-1.25 , 0.38]
Jahangard 2012 (10)	3.93	1.34	15	2.67	0.82	15	3.7%	1.10 [0.33 , 1.88]
Jørgensen 2013 (5)	18.8	11.5	42	22.8	13.7	24	5.0%	-0.32 [-0.83 , 0.18]
Kredlow 2017a (5)	24.5	14.4	14	39.6	13.6	12	3.5%	-1.04 [-1.87 , -0.21]
Laurenssen 2018 (2)	22.5	16.57	54	21.11	9.1	41	5.5%	0.10 [-0.31 , 0.51]
Leichsenring 2016 (11)	27.95	10.75	64	24.39	11.21	58	5.7%	0.32 [-0.04 , 0.68]
Leppänen 2016 (12)	1.55	1.7	19	1.84	1.45	32	4.7%	-0.18 [-0.75 , 0.38]
McMurran 2016 (13)	24.6	7.4	80	26.3	9.6	64	5.8%	-0.20 [-0.53 , 0.13]
Morton 2012 (14)	22.67	14.73	21	31	8.51	20	4.4%	-0.67 [-1.31 , -0.04]
Reneses 2013 (15)	15.9	13.2	18	22.8	11.2	26	4.4%	-0.56 [-1.18 , 0.05]
Zanarini 2018 (16)	24.18	16.15	39	31.21	16.62	38	5.3%	-0.42 [-0.88 , 0.03]
Subtotal (95% CI)			**870**			**698**	**100.0%**	**-0.39 [-0.61 , -0.17]**
Heterogeneity: Tau² = 0.19; Chi² = 84.66, df = 21 (P < 0.00001); I² = 75%								
Test for overall effect: Z = 3.44 (P = 0.0006)								
1.17.2 0-6 months follow-up								
Bateman 1999 (9)	19	7.4	22	28.7	7.4	16	29.6%	-1.28 [-2.00 , -0.57]
Gleeson 2012 (7)	10.8	4.6	4	14.5	7.1	4	9.2%	-0.54 [-1.97 , 0.90]
Jørgensen 2013 (5)	17.8	14	38	23.2	13.9	15	37.3%	-0.38 [-0.98 , 0.22]
Kredlow 2017a (17)	23.1	12.7	14	35.8	13	12	23.9%	-0.96 [-1.78 , -0.14]
Subtotal (95% CI)			**78**			**47**	**100.0%**	**-0.80 [-1.26 , -0.34]**
Heterogeneity: Tau² = 0.05; Chi² = 3.89, df = 3 (P = 0.27); I² = 23%								
Test for overall effect: Z = 3.44 (P = 0.0006)								
1.17.3 6-12 months follow-up								
Bateman 1999 (9)	13.3	6	22	21.5	8	15	25.7%	-1.17 [-1.88 , -0.45]
Blum 2008 (3)	24	20.9619	65	23.4	29.1884	59	37.9%	0.02 [-0.33 , 0.38]
Davidson 2006 (17)	26.5	14.8	52	31.1	16.6	47	36.4%	-0.29 [-0.69 , 0.11]
Subtotal (95% CI)			**139**			**121**	**100.0%**	**-0.40 [-0.95 , 0.16]**
Heterogeneity: Tau² = 0.18; Chi² = 8.70, df = 2 (P = 0.01); I² = 77%								
Test for overall effect: Z = 1.40 (P = 0.16)								
1.17.4 12 months and over follow-up								
Bateman 1999 (9)	11.9	3.3	22	20.4	10.5	15	15.0%	-1.17 [-1.88 , -0.45]
Davidson 2006 (17)	26.5	15.3	43	28.8	15.7	33	24.7%	-0.15 [-0.60 , 0.31]
Gregory 2008b (2)	16	11.5	11	23.8	10.6	13	12.2%	-0.68 [-1.51 , 0.15]
Jørgensen 2013 (9)	17.5	13.5	38	22.2	15.8	15	18.6%	-0.33 [-0.93 , 0.27]
McMurran 2016 (13)	20.3	10.7	69	22	12.1	52	29.5%	-0.15 [-0.51 , 0.21]
Subtotal (95% CI)			**183**			**128**	**100.0%**	**-0.40 [-0.74 , -0.06]**
Heterogeneity: Tau² = 0.07; Chi² = 7.58, df = 4 (P = 0.11); I² = 47%								
Test for overall effect: Z = 2.30 (P = 0.02)								



Footnotes

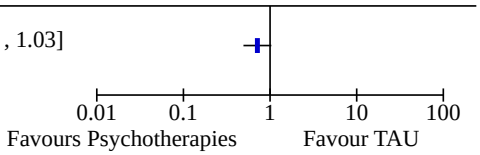
(1) Clinician-rated: HDRS-17
(2) Self-rated: BDI
(3) Self-reported: BDI
(4) Self-rated: HADS, depression

Analysis 1.17. (Continued)

(3) Self-reported: BDI
(4) Self-rated: HADS, depression
(5) BDI-II (SR)
(6) HADS - total score (SR)
(7) MADRS (CR)
(8) DASS-Depression (SR)
(9) BDI (SR)
(10) HDRS (CR)
(11) Clinician-rated: BDI
(12) Clinician-rated: BPDSI-IV, paranoid ideation
(13) HADS (SR)
(14) Self-rated: DASS, depression
(15) Clinician-rated: MADRS
(16) Self-rated: The Clinically Useful Depression Outcome Scale, total score
(17) Self-rated: BDI-II

Analysis 1.18. Comparison 1: Psychotherapy vs TAU, Outcome 18: Secondary: depression (dichotomous), at end of treatment

	Psychotherapies		TAU		Risk Ratio	Risk Ratio
Study or Subgroup	Events	Total	Events	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Rossouw 2012b (1)	20	40	28	40	0.71 [0.49 , 1.03]	
Test for subgroup differences: Not applicable						

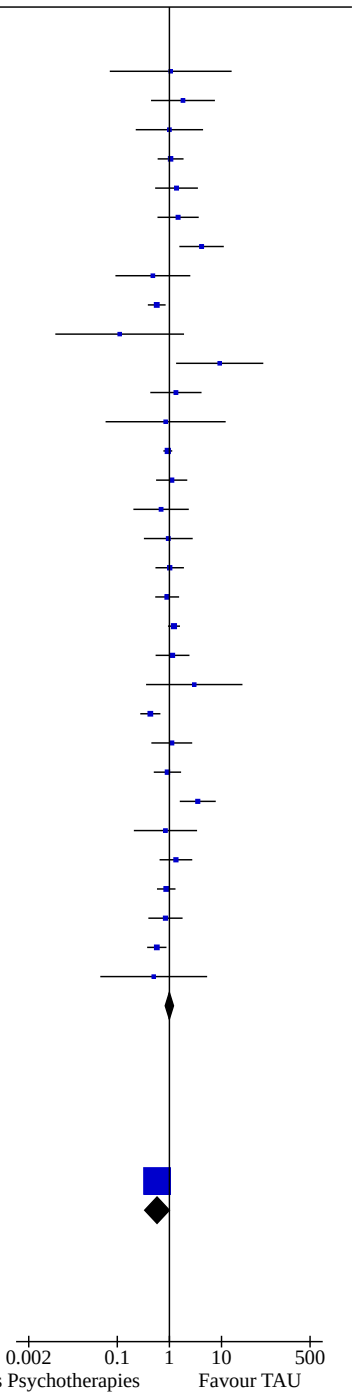


Footnotes

(1) MFQ - participants beyond depression cut-off

Analysis 1.19. Comparison 1: Psychotherapy vs TAU, Outcome 19: Secondary: attrition (dichotomous)

Study or Subgroup	Psychotherapies Events	Total	TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
1.19.1 End of treatment						
Amianto 2011	1	17	1	18	0.4%	1.06 [0.07 , 15.62]
Andreoli 2016	17	140	2	30	1.4%	1.82 [0.44 , 7.47]
Bateman 1999	3	22	3	22	1.3%	1.00 [0.23 , 4.42]
Bateman 2009	19	71	16	63	4.7%	1.05 [0.59 , 1.87]
Borschmann 2013	9	46	6	42	2.6%	1.37 [0.53 , 3.52]
Bos 2010	10	42	6	37	2.7%	1.47 [0.59 , 3.65]
Carter 2010	18	38	4	35	2.4%	4.14 [1.55 , 11.06]
Davidson 2006	2	54	4	52	1.0%	0.48 [0.09 , 2.52]
Doering 2010	20	52	35	52	6.2%	0.57 [0.39 , 0.85]
Farrell 2009	0	16	4	16	0.4%	0.11 [0.01 , 1.91]
Feigenbaum 2012	15	26	1	16	0.8%	9.23 [1.35 , 63.35]
Gleeson 2012	4	8	3	8	2.0%	1.33 [0.43 , 4.13]
Gratz 2006	1	13	1	11	0.4%	0.85 [0.06 , 12.01]
Gratz 2014	26	31	27	30	8.0%	0.93 [0.77 , 1.13]
Jørgensen 2013	19	58	8	27	3.9%	1.11 [0.56 , 2.20]
Koons 2001a	3	13	5	15	1.7%	0.69 [0.20 , 2.35]
Kramer 2016	5	21	5	20	2.1%	0.95 [0.32 , 2.80]
Laurenssen 2018	16	54	12	41	4.3%	1.01 [0.54 , 1.90]
Leichsenring 2016 (1)	19	64	19	58	5.0%	0.91 [0.53 , 1.54]
Leppänen 2016	20	24	32	47	7.4%	1.22 [0.94 , 1.60]
Linehan 1991	10	30	9	31	3.5%	1.15 [0.54 , 2.42]
Linehan 1994	3	13	1	13	0.7%	3.00 [0.36 , 25.21]
Linehan 2006	16	52	35	49	5.7%	0.43 [0.28 , 0.67]
Morton 2012	7	21	6	20	2.7%	1.11 [0.45 , 2.74]
Philips 2018	11	24	11	22	4.4%	0.92 [0.50 , 1.68]
Priebe 2012	21	40	6	40	3.3%	3.50 [1.58 , 7.75]
Reneses 2013	3	25	4	28	1.4%	0.84 [0.21 , 3.39]
Robinson 2016	12	34	9	34	3.7%	1.33 [0.65 , 2.74]
Rossouw 2012b	20	40	23	40	6.1%	0.87 [0.58 , 1.31]
Stanley 2017	9	37	11	38	3.5%	0.84 [0.39 , 1.79]
Van den Bosch 2005	14	31	26	33	5.9%	0.57 [0.37 , 0.88]
Zanarini 2018	1	40	2	40	0.5%	0.50 [0.05 , 5.30]
Subtotal (95% CI)		**1197**		**1028**	**100.0%**	**1.00 [0.83 , 1.20]**
Total events:	354		337			
Heterogeneity: Tau² = 0.10; Chi² = 61.81, df = 31 (P = 0.0008); I² = 50%						
Test for overall effect: Z = 0.02 (P = 0.98)						
1.19.2 0-6 months follow-up						
Soler 2009	11	30	19	30	100.0%	0.58 [0.34 , 1.00]
Subtotal (95% CI)		**30**		**30**	**100.0%**	**0.58 [0.34 , 1.00]**
Total events:	11		19			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.97 (P = 0.05)						



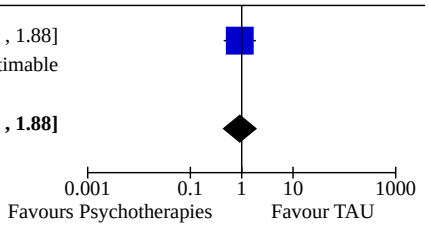
Footnotes

(1) lost to follow-up for any reason

Analysis 1.20. Comparison 1: Psychotherapy vs TAU, Outcome 20: Secondary: non-serious adverse effects (dichotomous), at end of treatment

Study or Subgroup	Psychotherapies Events	Psychotherapies Total	TAU Events	TAU Total	Weight	Risk Ratio M-H, Random, 95% CI
McMurran 2016 (1)	13	154	14	152	100.0%	0.92 [0.45 , 1.88]
Stanley 2017 (2)	0	37	0	38		Not estimable
Total (95% CI)		**191**		**190**	**100.0%**	**0.92 [0.45 , 1.88]**
Total events:	13		14			

Heterogeneity: Not applicable
Test for overall effect: Z = 0.24 (P = 0.81)
Test for subgroup differences: Not applicable

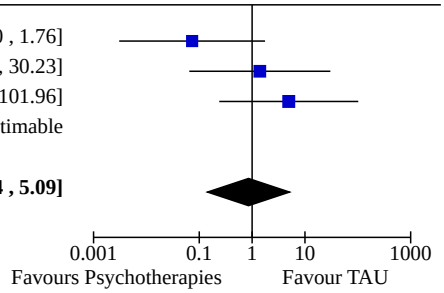


Footnotes
(1) participants with adverse event other than death for any reason or hospitalisation
(2) adverse events others than serious adverse events

Analysis 1.21. Comparison 1: Psychotherapy vs TAU, Outcome 21: Secondary: serious adverse effects (dichotomous), at end of treatment

Study or Subgroup	Psychotherapies Events	Psychotherapies Total	TAU Events	TAU Total	Weight	Risk Ratio IV, Fixed, 95% CI
Andreoli 2016 (1)	0	140	1	30	31.5%	0.07 [0.00 , 1.76]
Davidson 2006 (1)	1	14	0	6	33.7%	1.40 [0.06 , 30.23]
McMurran 2016 (1)	2	154	0	152	34.7%	4.94 [0.24 , 101.96]
Stanley 2017 (1)	0	37	0	38		Not estimable
Total (95% CI)		**345**		**226**	**100.0%**	**0.86 [0.14 , 5.09]**
Total events:	3		1			

Heterogeneity: Chi² = 3.68, df = 2 (P = 0.16); I² = 46%
Test for overall effect: Z = 0.17 (P = 0.86)
Test for subgroup differences: Not applicable



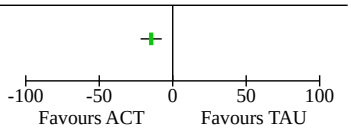
Footnotes
(1) died by suicide

Comparison 2. Acceptance and commitment therapy (ACT) vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
2.1 Primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
2.2 Secondary: affective instability (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
2.3 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
2.4 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 2.1. Comparison 2: Acceptance and commitment therapy (ACT) vs TAU, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

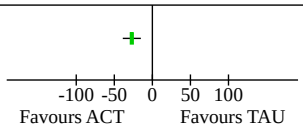
Study or Subgroup	ACT Mean	ACT SD	ACT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Morton 2012 (1)	32.76	12.47	21	47.42	11	20	-14.66 [-21.85 , -7.47]	
Test for subgroup differences: Not applicable								



Footnotes
(1) Self-rated: BEST

Analysis 2.2. Comparison 2: Acceptance and commitment therapy (ACT) vs TAU, Outcome 2: Secondary: affective instability (continuous), at end of treatment

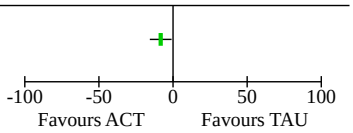
Study or Subgroup	ACT Mean	ACT SD	ACT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Morton 2012 (1)	113.04	17.64	21	140.04	20.88	20	-27.00 [-38.86 , -15.14]	
Test for subgroup differences: Not applicable								



Footnotes
(1) Self-rated: DERS, emotion dysregulation

Analysis 2.3. Comparison 2: Acceptance and commitment therapy (ACT) vs TAU, Outcome 3: Secondary: depression (continuous), at end of treatment

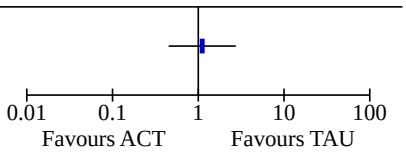
Study or Subgroup	ACT Mean	ACT SD	ACT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Morton 2012 (1)	22.67	14.73	21	31	8.51	20	-8.33 [-15.65 , -1.01]	
Test for subgroup differences: Not applicable								



Footnotes
(1) Self-rated: DASS, depression

Analysis 2.4. Comparison 2: Acceptance and commitment therapy (ACT) vs TAU, Outcome 4: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	ACT Events	ACT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI	Risk Ratio M-H, Fixed, 95% CI
Morton 2012	7	21	6	20	1.11 [0.45 , 2.74]	
Test for subgroup differences: Not applicable						



Comparison 3. Dialectical behavior therapy (DBT) vs TAU

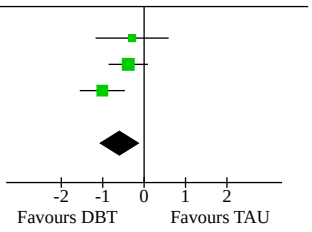
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3.1 Primary: BPD symptom severity (continuous), at end of treatment	3	149	Std. Mean Difference (IV, Random, 95% CI)	-0.60 [-1.05, -0.14]
3.2 Primary, self-harm (continuous)	7		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
3.2.1 End of treatment	7	376	Std. Mean Difference (IV, Random, 95% CI)	-0.28 [-0.48, -0.07]
3.2.2 6-12 months follow-up	2	141	Std. Mean Difference (IV, Random, 95% CI)	-0.26 [-0.59, 0.07]
3.3 Primary: suicide-related outcomes (continuous), at end of treatment	5	231	Std. Mean Difference (IV, Random, 95% CI)	-0.23 [-0.68, 0.23]
3.4 Primary: suicide-related outcomes, attempts (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.5 Primary: psychosocial functioning (continuous), at end of treatment	6	225	Std. Mean Difference (IV, Random, 95% CI)	-0.36 [-0.69, -0.03]
3.6 Secondary: anger (continuous)	5		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
3.6.1 End of treatment	5	230	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-0.86, -0.09]
3.6.2 6-12 months follow-up	1	78	Std. Mean Difference (IV, Random, 95% CI)	-0.17 [-0.62, 0.27]
3.6.3 Above 12 months follow-up	1	80	Std. Mean Difference (IV, Random, 95% CI)	0.02 [-0.42, 0.46]
3.7 Secondary: affective instability (continuous), at end of treatment	2	80	Std. Mean Difference (IV, Random, 95% CI)	-0.57 [-1.64, 0.51]
3.8 Secondary: chronic feelings of emptiness (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
3.9 Secondary: impulsivity (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
3.9.1 End of treatment	3	128	Std. Mean Difference (IV, Random, 95% CI)	-0.35 [-0.71, -0.00]
3.9.2 6-12 months follow-up	1	44	Std. Mean Difference (IV, Random, 95% CI)	0.30 [-0.30, 0.90]
3.10 Secondary: interpersonal problems (continuous), at end of treatment	3	148	Std. Mean Difference (IV, Random, 95% CI)	-0.12 [-0.45, 0.20]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
3.11 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	4	194	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-0.73, -0.16]
3.12 Secondary: depression (continuous)	5		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
3.12.1 End of treatment	5	219	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-0.98, 0.03]
3.12.2 6-12 months follow-up	1	81	Std. Mean Difference (IV, Random, 95% CI)	-0.23 [-0.67, 0.21]
3.13 Secondary: attrition (dichotomous)	11		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
3.13.1 End of treatment	10	591	Risk Ratio (M-H, Random, 95% CI)	1.27 [0.70, 2.31]
3.13.2 0-6 months follow-up	1	60	Risk Ratio (M-H, Random, 95% CI)	0.58 [0.34, 1.00]
3.14 Secondary: adverse effects (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
3.15 Secondary: serious adverse effects (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 3.1. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Koons 2001a (1)	3.6	1.6	10	4.2	2.3	10	20.0%	-0.29 [-1.17 , 0.59]
Priebe 2012 (2)	13.1	6.9	33	15.9	7.5	37	42.7%	-0.38 [-0.86 , 0.09]
Soler 2009 (3)	3.5	1.2	29	4.44	0.52	30	37.3%	-1.01 [-1.55 , -0.47]
Total (95% CI)			**72**			**77**	**100.0%**	**-0.60 [-1.05 , -0.14]**

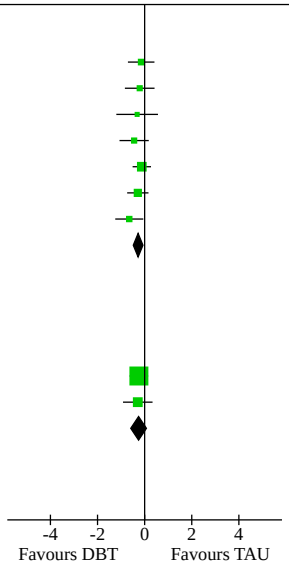
Heterogeneity: Tau² = 0.07; Chi² = 3.45, df = 2 (P = 0.18); I² = 42%
Test for overall effect: Z = 2.57 (P = 0.01)
Test for subgroup differences: Not applicable



Footnotes
(1) SCID-II - mean number of BPD criteria met (CR)
(2) ZAN-BPD total (CR)
(3) CCGI-BPD global (CR)

Analysis 3.2. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 2: Primary, self-harm (continuous)

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
3.2.1 End of treatment								
Carter 2010 (1)	5.2	7.47	20	8.42	26.92	31	13.2%	-0.15 [-0.71 , 0.42]
Feigenbaum 2012 (2)	2.4	3.2	25	3.1	3.4	16	10.6%	-0.21 [-0.84 , 0.42]
Koons 2001a (3)	0.4	1.3	10	1	2.2	10	5.4%	-0.32 [-1.20 , 0.57]
Linehan 1991 (4)	0.55	0.94	20	9.33	26.95	21	10.9%	-0.45 [-1.07 , 0.17]
Linehan 2006 (2)	14.17	37.63	52	18.94	40.73	49	27.5%	-0.12 [-0.51 , 0.27]
Priebe 2012 (5)	39.2	73.4	38	63.7	92.9	38	20.5%	-0.29 [-0.74 , 0.16]
Van den Bosch 2005 (6)	3.31	13.15	22	41.6	78.76	24	11.9%	-0.65 [-1.25 , -0.06]
Subtotal (95% CI)			**187**			**189**	**100.0%**	**-0.28 [-0.48 , -0.07]**
Heterogeneity: Tau² = 0.00; Chi² = 2.69, df = 6 (P = 0.85); I² = 0%								
Test for overall effect: Z = 2.65 (P = 0.008)								
3.2.2 6-12 months follow-up								
Linehan 2006 (7)	5.43	6.19	52	15.93	60.96	49	71.9%	-0.24 [-0.64 , 0.15]
Van den Bosch 2005 (8)	10.9	34.28	18	33.9	99.39	22	28.1%	-0.29 [-0.92 , 0.34]
Subtotal (95% CI)			**70**			**71**	**100.0%**	**-0.26 [-0.59 , 0.07]**
Heterogeneity: Tau² = 0.00; Chi² = 0.02, df = 1 (P = 0.90); I² = 0%								
Test for overall effect: Z = 1.52 (P = 0.13)								

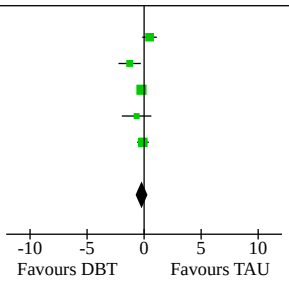


Footnotes

(1) number of self-harm episodes 3 to 6 months
(2) SASII - frequency of self-harm (CR)
(3) PHI - deliberate self-harm frequency (last 3 months) (CR)
(4) Mean number of parasuicidal acts (last 3 months)
(5) Days of self-harm and type of deliberate self-harm recorded in an interview (CR)
(6) LPC - self-mutilation (last 3 months) (CR)
(7) Observer rated: SASII - NSSI
(8) LPC self-mutilation (last 3 months)

Analysis 3.3. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 3: Primary: suicide-related outcomes (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Feigenbaum 2012 (1)	0.24	0.43	25	0.06	0.25	16	21.7%	0.48 [-0.16 , 1.11]
Koons 2001a (2)	26.2	8	10	41.5	14.3	10	13.7%	-1.26 [-2.24 , -0.29]
Linehan 2006 (1)	0.98	1.46	52	1.37	1.87	49	29.6%	-0.23 [-0.62 , 0.16]
Mehlum 2014 (3)	26.5	6.3	5	41.7	28.9	5	9.3%	-0.66 [-1.95 , 0.64]
Soler 2009 (4)	2.44	1.24	29	2.55	0.88	30	25.6%	-0.10 [-0.61 , 0.41]
Total (95% CI)			**121**			**110**	**100.0%**	**-0.23 [-0.68 , 0.23]**
Heterogeneity: Tau² = 0.14; Chi² = 9.45, df = 4 (P = 0.05); I² = 58%								
Test for overall effect: Z = 0.97 (P = 0.33)								
Test for subgroup differences: Not applicable								



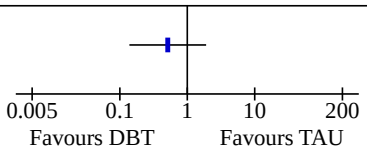
Footnotes

(1) SASII-suicide attempts (CR)
(2) BSS (SR)
(3) SIQ-jr (SR)
(4) CGI-BPD, suicidality (CR)

Analysis 3.4. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 4: Primary: suicide-related outcomes, attempts (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Stanley 2017	3	37	6	38	0.51 [0.14 , 1.90]

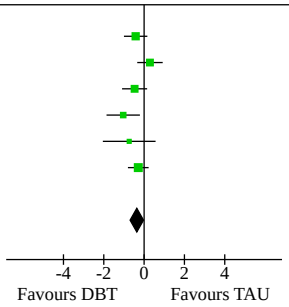
Test for subgroup differences: Not applicable



Analysis 3.5. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 5: Primary: psychosocial functioning (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Carter 2010 (1)	8.15	11.48	20	13.07	11.59	28	20.6%	-0.42 [-1.00 , 0.16]
Feigenbaum 2012 (2)	2.48	0.85	25	2.22	0.92	16	18.5%	0.29 [-0.34 , 0.92]
Kramer 2016 (3)	12.76	7.79	21	16	5.42	20	18.8%	-0.47 [-1.09 , 0.15]
Linehan 1994 (4)	-51.42	9.71	13	-40.43	10.8	13	12.5%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (5)	-59.4	6.6	5	-54.2	6.1	5	5.8%	-0.74 [-2.05 , 0.57]
Soler 2009 (6)	3.27	0.9	29	3.57	1.13	30	23.9%	-0.29 [-0.80 , 0.22]
Total (95% CI)			**113**			**112**	**100.0%**	**-0.36 [-0.69 , -0.03]**

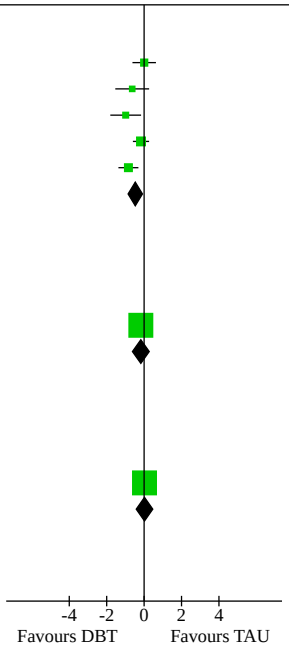
Heterogeneity: Tau² = 0.05; Chi² = 7.20, df = 5 (P = 0.21); I² = 31%
Test for overall effect: Z = 2.14 (P = 0.03)
Test for subgroup differences: Not applicable



Footnotes
(1) BDQ-days out of role (SR)
(2) CORE-OM (SR)
(3) OQ45, social role at discharge (SR)
(4) GAS (CR)
(5) C-GAS (CR)
(6) CGI-global improvement, patient-rated (SR)

Analysis 3.6. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 6: Secondary: anger (continuous)

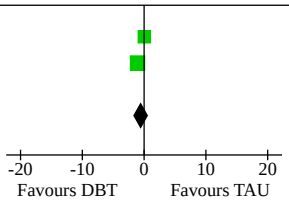
Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
3.6.1 End of treatment								
Feigenbaum 2012 (1)	83.4	20.36	25	83.3	17.94	16	20.3%	0.01 [-0.62 , 0.63]
Koons 2001a (2)	14.5	3.9	10	17.9	6.1	10	12.8%	-0.64 [-1.54 , 0.27]
Linehan 1994 (3)	32.15	7.19	13	40.08	8.37	13	14.6%	-0.98 [-1.81 , -0.16]
Linehan 2006 (4)	1.84	0.51	48	1.93	0.57	36	28.4%	-0.17 [-0.60 , 0.27]
Soler 2009 (5)	3.11	1.02	29	3.88	0.78	30	23.9%	-0.84 [-1.37 , -0.30]
Subtotal (95% CI)			**125**			**105**	**100.0%**	**-0.47 [-0.86 , -0.09]**
Heterogeneity: Tau² = 0.09; Chi² = 7.47, df = 4 (P = 0.11); I² = 46%								
Test for overall effect: Z = 2.41 (P = 0.02)								
3.6.2 6-12 months follow-up								
Linehan 2006 (4)	1.89	0.53	44	1.99	0.61	34	100.0%	-0.17 [-0.62 , 0.27]
Subtotal (95% CI)			**44**			**34**	**100.0%**	**-0.17 [-0.62 , 0.27]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.76 (P = 0.44)								
3.6.3 Above 12 months follow-up								
Linehan 2006 (4)	1.9	0.43	45	1.89	0.52	35	100.0%	0.02 [-0.42 , 0.46]
Subtotal (95% CI)			**45**			**35**	**100.0%**	**0.02 [-0.42 , 0.46]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.09 (P = 0.93)								



Footnotes
(1) STAXI - anger out (geometric mean after log transformation) (SR)
(2) STAXI - anger out (SR)
(3) STAXI, anger trait (SR)
(4) STAXI-anger out (SR)
(5) CGI-BPD, anger (CR)

Analysis 3.7. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 7: Secondary: affective instability (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bianchini 2019 (1)	65.6	9.4	10	65.1	15.57	11	45.4%	0.04 [-0.82 , 0.89]
Soler 2009 (2)	3.61	1.19	29	4.66	0.7	30	54.6%	-1.07 [-1.61 , -0.52]
Total (95% CI)			**39**			**41**	**100.0%**	**-0.57 [-1.64 , 0.51]**
Heterogeneity: Tau² = 0.47; Chi² = 4.52, df = 1 (P = 0.03); I² = 78%								
Test for overall effect: Z = 1.03 (P = 0.30)								
Test for subgroup differences: Not applicable								

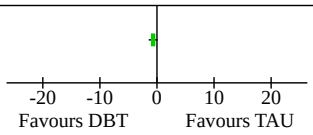


Footnotes
(1) DERS total score (SR)
(2) CGI-BPD, affective instability (CR)

Analysis 3.8. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 8: Secondary: chronic feelings of emptiness (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Soler 2009 (1)	4.33	1.57	29	5	1.5	30	-0.67 [-1.45 , 0.11]

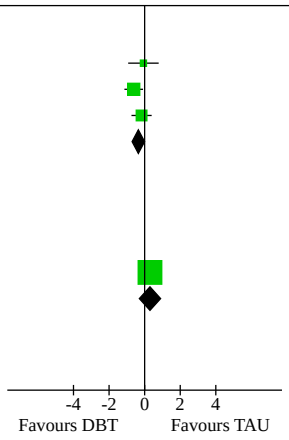
Test for subgroup differences: Not applicable



Footnotes
(1) CGI-BPD, emptiness (CR)

Analysis 3.9. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 9: Secondary: impulsivity (continuous)

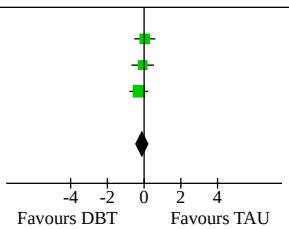
Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
3.9.1 End of treatment								
Bianchini 2019 (1)	50.66	10.7	10	51.75	18.42	11	16.8%	-0.07 [-0.93 , 0.79]
Soler 2009 (2)	3.61	0.97	29	4.11	0.6	30	45.0%	-0.61 [-1.14 , -0.09]
Van den Bosch 2005 (3)	0.92	0.74	23	1.06	0.84	25	38.2%	-0.17 [-0.74 , 0.39]
Subtotal (95% CI)			**62**			**66**	**100.0%**	**-0.35 [-0.71 , -0.00]**
Heterogeneity: Tau² = 0.00; Chi² = 1.77, df = 2 (P = 0.41); I² = 0%								
Test for overall effect: Z = 1.98 (P = 0.05)								
3.9.2 6-12 months follow-up								
Van den Bosch 2005 (4)	1.08	0.93	20	0.85	0.57	24	100.0%	0.30 [-0.30 , 0.90]
Subtotal (95% CI)			**20**			**24**	**100.0%**	**0.30 [-0.30 , 0.90]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.98 (P = 0.33)								



Footnotes
(1) BIS-11 total score (SR)
(2) CGI-BPD - impulsivity (CR)
(3) BPDSI-IV - impulsivity (CR)
(4) Observer rated: BPDSI-IV, impulsivity

Analysis 3.10. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 10: Secondary: interpersonal problems (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Carter 2010 (1)	-48.75	19.36	20	-49.73	30.23	28	32.0%	0.04 [-0.54 , 0.61]
Kramer 2016 (2)	21.05	8.48	21	21.7	7.65	20	28.1%	-0.08 [-0.69 , 0.53]
Soler 2009 (3)	4.22	0.8	29	4.44	0.72	30	40.0%	-0.29 [-0.80 , 0.23]
Total (95% CI)			**70**			**78**	**100.0%**	**-0.12 [-0.45 , 0.20]**
Heterogeneity: Tau² = 0.00; Chi² = 0.70, df = 2 (P = 0.70); I² = 0%								
Test for overall effect: Z = 0.75 (P = 0.45)								
Test for subgroup differences: Not applicable								

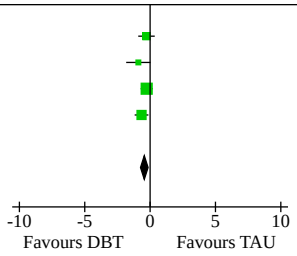


Footnotes
(1) Self reported: WHOQOL-Bref social relationships
(2) OQ45.2 - interpersonal (SR)
(3) CGI-BPD, unstable relations (CR)

Analysis 3.11. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 11: Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Feigenbaum 2012 (1)	28.52	25.12	25	34.9	17.83	16	20.9%	-0.28 [-0.91 , 0.35]
Koons 2001a (1)	13.2	12	10	30.6	23.3	10	9.6%	-0.90 [-1.83 , 0.03]
Priebe 2012 (2)	48	11.7	40	51	10.9	34	39.4%	-0.26 [-0.72 , 0.20]
Soler 2009 (2)	8.74	5.06	29	11.89	4.4	30	30.1%	-0.66 [-1.18 , -0.13]
Total (95% CI)			**104**			**90**	**100.0%**	**-0.45 [-0.73 , -0.16]**

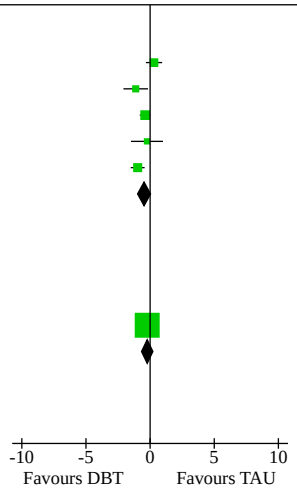
Heterogeneity: Tau² = 0.00; Chi² = 2.42, df = 3 (P = 0.49); I² = 0%
Test for overall effect: Z = 3.03 (P = 0.002)
Test for subgroup differences: Not applicable



Footnotes
(1) DES (SR)
(2) BPRS (CR)

Analysis 3.12. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 12: Secondary: depression (continuous)

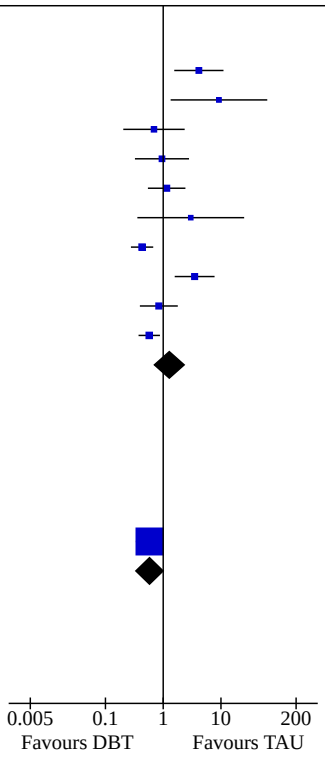
Study or Subgroup	DBT Mean	DBT SD	DBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
3.12.1 End of treatment								
Feigenbaum 2012 (1)	32.2	12.8	25	28.1	13.7	16	22.1%	0.31 [-0.33 , 0.94]
Koons 2001a (2)	13.4	7.5	10	29.3	17.7	10	15.2%	-1.12 [-2.08 , -0.16]
Linehan 2006 (3)	14	7.3	50	17	8.2	39	27.3%	-0.39 [-0.81 , 0.04]
Mehlum 2014 (4)	19.6	8.6	5	21.4	3.8	5	11.0%	-0.24 [-1.49 , 1.00]
Soler 2009 (5)	11.11	3.99	29	16	5.78	30	24.3%	-0.97 [-1.51 , -0.43]
Subtotal (95% CI)			**119**			**100**	**100.0%**	**-0.47 [-0.98 , 0.03]**
Heterogeneity: Tau² = 0.20; Chi² = 11.09, df = 4 (P = 0.03); I² = 64%								
Test for overall effect: Z = 1.83 (P = 0.07)								
3.12.2 6-12 months follow-up								
Linehan 2006 (5)	12.6	6.8	46	14.4	9.1	35	100.0%	-0.23 [-0.67 , 0.21]
Subtotal (95% CI)			**46**			**35**	**100.0%**	**-0.23 [-0.67 , 0.21]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.01 (P = 0.31)								



Footnotes
(1) BDI-II (SR)
(2) BDI (SR)
(3) Ham-D 17 (SR)
(4) MADRS (CR)
(5) Ham-D-17 (CR)

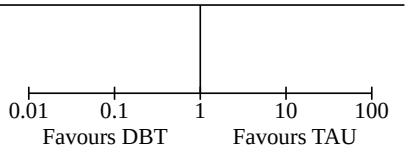
Analysis 3.13. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 13: Secondary: attrition (dichotomous)

Study or Subgroup	DBT Events	DBT Total	TAU Events	TAU Total	Weight	Risk Ratio M-H, Random, 95% CI
3.13.1 End of treatment						
Carter 2010	18	38	4	35	10.2%	4.14 [1.55 , 11.06]
Feigenbaum 2012	15	26	1	16	5.7%	9.23 [1.35 , 63.35]
Koons 2001a	3	13	5	15	8.8%	0.69 [0.20 , 2.35]
Kramer 2016	5	21	5	20	9.6%	0.95 [0.32 , 2.80]
Linehan 1991	10	30	9	31	11.6%	1.15 [0.54 , 2.42]
Linehan 1994	3	13	1	13	5.0%	3.00 [0.36 , 25.21]
Linehan 2006	16	52	35	49	13.1%	0.43 [0.28 , 0.67]
Priebe 2012	21	40	6	40	11.3%	3.50 [1.58 , 7.75]
Stanley 2017	9	37	11	38	11.5%	0.84 [0.39 , 1.79]
Van den Bosch 2005	14	31	26	33	13.2%	0.57 [0.37 , 0.88]
Subtotal (95% CI)		**301**		**290**	**100.0%**	**1.27 [0.70 , 2.31]**
Total events:	114		103			
Heterogeneity: Tau² = 0.65; Chi² = 46.77, df = 9 (P < 0.00001); I² = 81%						
Test for overall effect: Z = 0.80 (P = 0.42)						
3.13.2 0-6 months follow-up						
Soler 2009	11	30	19	30	100.0%	0.58 [0.34 , 1.00]
Subtotal (95% CI)		**30**		**30**	**100.0%**	**0.58 [0.34 , 1.00]**
Total events:	11		19			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.97 (P = 0.05)						



Analysis 3.14. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 14: Secondary: adverse effects (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Stanley 2017 (1)	0	37	0	38	Not estimable
Test for subgroup differences: Not applicable					

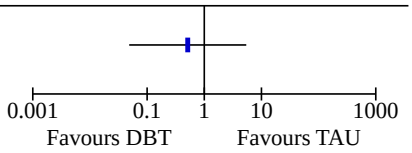


Footnotes

(1) adverse events others than serious adverse events

Analysis 3.15. Comparison 3: Dialectical behavior therapy (DBT) vs TAU, Outcome 15: Secondary: serious adverse effects (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Stanley 2017 (1)	1	37	2	38	0.51 [0.05 , 5.42]
Test for subgroup differences: Not applicable					



Footnotes

(1) adverse effects that results in death, threatens life, requires inpatient hospitalization or extends a current hospital stay, results in an ong

Comparison 4. Mentalisation based therapy (MBT) vs TAU

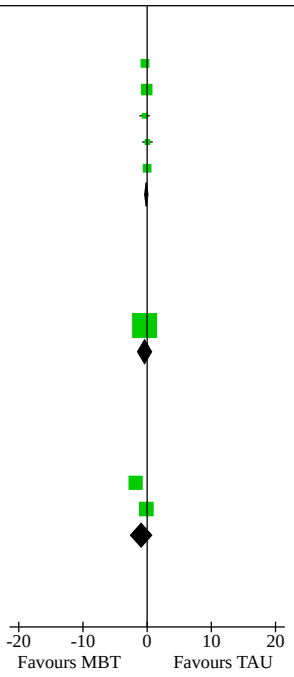
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
4.1 Primary: BPD symptom severity (continuous)	6		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
4.1.1 End of treatment	5	267	Std. Mean Difference (IV, Random, 95% CI)	-0.13 [-0.38, 0.11]
4.1.2 0-6 months follow-up	1	15	Std. Mean Difference (IV, Random, 95% CI)	-0.40 [-1.49, 0.68]
4.1.3 Above 12 months follow-up	2	97	Std. Mean Difference (IV, Random, 95% CI)	-0.94 [-2.58, 0.70]
4.2 Primary: self-harm (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
4.3 Primary: self-harm (dichotomous)	3		Risk Ratio (IV, Random, 95% CI)	Subtotals only
4.3.1 End of treatment	3	252	Risk Ratio (IV, Random, 95% CI)	0.62 [0.49, 0.80]
4.3.2 0-6 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.14 [0.04, 0.56]
4.3.3 6-12 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.27 [0.10, 0.68]
4.3.4 Above 12 months follow-up	1	41	Risk Ratio (IV, Random, 95% CI)	0.33 [0.15, 0.76]
4.4 Primary: suicide-related outcomes (dichotomous)	3		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
4.4.1 End of treatment	3	218	Risk Ratio (M-H, Random, 95% CI)	0.10 [0.04, 0.30]
4.4.2 0-6 months follow-up	1	41	Risk Ratio (M-H, Random, 95% CI)	0.25 [0.06, 1.05]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
4.4.3 Above 12 months follow-up	1	41	Risk Ratio (M-H, Random, 95% CI)	0.29 [0.11, 0.74]
4.5 Primary: psychosocial functioning (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
4.5.1 End of treatment	3	239	Std. Mean Difference (IV, Random, 95% CI)	-0.54 [-1.24, 0.16]
4.5.2 Above 12 months follow-up	2	104	Std. Mean Difference (IV, Random, 95% CI)	-0.41 [-0.97, 0.15]
4.6 Secondary: interpersonal problems (continuous)	5		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
4.6.1 End of treatment	5	357	Std. Mean Difference (IV, Random, 95% CI)	-0.68 [-1.33, -0.02]
4.6.2 0-6 months follow-up	1	53	Std. Mean Difference (IV, Random, 95% CI)	-0.41 [-1.01, 0.20]
4.6.3 Above 12 months follow-up	2	96	Std. Mean Difference (IV, Random, 95% CI)	-0.28 [-0.71, 0.14]
4.7 Secondary: depression (continuous)	4		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
4.7.1 End of treatment	4	333	Std. Mean Difference (IV, Random, 95% CI)	-0.58 [-1.22, 0.05]
4.7.2 0-6 months follow-up	2	91	Std. Mean Difference (IV, Random, 95% CI)	-0.81 [-1.69, 0.07]
4.7.3 6-12 months follow-up	1	37	Std. Mean Difference (IV, Random, 95% CI)	-1.17 [-1.88, -0.45]
4.7.4 Above 12 months follow-up	2	90	Std. Mean Difference (IV, Random, 95% CI)	-0.72 [-1.55, 0.10]
4.8 Secondary: depression (dichotomous), at end of treatment	1		Risk Ratio (IV, Fixed, 95% CI)	Subtotals only
4.9 Secondary: attrition (dichotomous), at end of treatment	7	552	Risk Ratio (M-H, Random, 95% CI)	0.99 [0.79, 1.25]
4.10 Secondary: adverse effects (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
4.11 Mentalisation-based treatment for eating disorders (MBT-ED) versus specialist supportive clinical management (SSCM-ED) (generic inverse variance)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
4.11.1 Primary: psychosocial functioning (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-0.07 [-0.86, 0.72]
4.11.2 Primary: psychosocial functioning (dichotomous), at 0-6 months follow-up	1		Mean Difference (IV, Fixed, 95% CI)	-0.44 [-1.52, 0.64]
4.11.3 Secondary: interpersonal problems (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-0.10 [-0.89, 0.69]
4.11.4 Secondary: interpersonal problems (continuous), at 0-6 months follow-up	1		Mean Difference (IV, Fixed, 95% CI)	-0.06 [-1.15, 1.03]
4.11.5 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	0.19 [-0.60, 0.98]
4.11.6 Secondary: depression (continuous), at 0-6 months follow-up	1		Mean Difference (IV, Fixed, 95% CI)	0.51 [-0.62, 1.64]

Analysis 4.1. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 1: Primary: BPD symptom severity (continuous)

Study or Subgroup	MBT Mean	MBT SD	MBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
4.1.1 End of treatment								
Jørgensen 2013 (1)	2.8	2.5	42	3.6	2.1	24	23.3%	-0.33 [-0.84 , 0.17]
Laurenssen 2018 (2)	20.63	11.45	54	21.39	10.43	41	36.0%	-0.07 [-0.47 , 0.34]
Philips 2018 (3)	17	9.1	13	20.7	9.1	11	9.0%	-0.39 [-1.20 , 0.42]
Robinson 2016 (4)	9.64	7.41	12	9.27	7.39	11	8.9%	0.05 [-0.77 , 0.87]
Rossouw 2012b (5)	2.79	0.5385	29	3.06	65.7267	30	22.8%	-0.01 [-0.52 , 0.50]
Subtotal (95% CI)			**150**			**117**	**100.0%**	**-0.13 [-0.38 , 0.11]**
Heterogeneity: Tau² = 0.00; Chi² = 1.53, df = 4 (P = 0.82); I² = 0%								
Test for overall effect: Z = 1.09 (P = 0.28)								
4.1.2 0-6 months follow-up								
Robinson 2016 (4)	7.1	6.19	10	10	7.97	5	100.0%	-0.40 [-1.49 , 0.68]
Subtotal (95% CI)			**10**			**5**	**100.0%**	**-0.40 [-1.49 , 0.68]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.73 (P = 0.47)								
4.1.3 Above 12 months follow-up								
Bateman 1999 (6)	5.5	5.2	22	15.1	5.3	19	49.0%	-1.79 [-2.53 , -1.06]
Jørgensen 2013 (1)	2.2	2.4	40	2.5	2.7	16	51.0%	-0.12 [-0.70 , 0.46]
Subtotal (95% CI)			**62**			**35**	**100.0%**	**-0.94 [-2.58 , 0.70]**
Heterogeneity: Tau² = 1.29; Chi² = 12.25, df = 1 (P = 0.0005); I² = 92%								
Test for overall effect: Z = 1.12 (P = 0.26)								

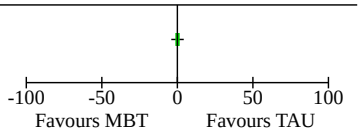


Footnotes

(1) SCID-BPD (CR)
(2) BPDSI-IV (CR)
(3) BPDSI-IV-total (CR)
(4) Zan-BPD-total (CR)
(5) BPFS-C (SR)
(6) Clinician rated: ZAN-BPD total

Analysis 4.2. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 2: Primary: self-harm (continuous), at end of treatment

Study or Subgroup	MBT Mean	MBT SD	MBT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Philips 2018 (1)	2.3	5.5	13	2.2	4.8	11	0.10 [-4.02 , 4.22]
Test for subgroup differences: Not applicable							

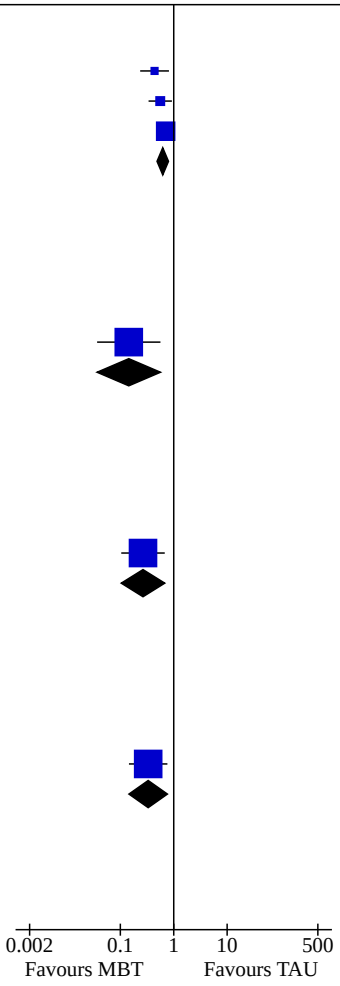


Footnotes

(1) DSHI-SF (SR)

Analysis 4.3. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 3: Primary: self-harm (dichotomous)

Study or Subgroup	MBT Events	MBT Total	TAU Events	TAU Total	Weight	Risk Ratio IV, Random, 95% CI
4.3.1 End of treatment						
Bateman 1999 (1)	7	19	16	19	15.2%	0.44 [0.24 , 0.81]
Bateman 2009 (1)	17	71	27	63	22.5%	0.56 [0.34 , 0.92]
Rossouw 2012b	24	40	34	40	62.3%	0.71 [0.53 , 0.94]
Subtotal (95% CI)		**130**		**122**	**100.0%**	**0.62 [0.49 , 0.80]**
Total events:	48		77			
Heterogeneity: Tau² = 0.00; Chi² = 2.16, df = 2 (P = 0.34); I² = 7%						
Test for overall effect: Z = 3.76 (P = 0.0002)						
4.3.2 0-6 months follow-up						
Bateman 1999 (1)	2	22	12	19	100.0%	0.14 [0.04 , 0.56]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.14 [0.04 , 0.56]**
Total events:	2		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.78 (P = 0.005)						
4.3.3 6-12 months follow-up						
Bateman 1999 (1)	4	22	13	19	100.0%	0.27 [0.10 , 0.68]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.27 [0.10 , 0.68]**
Total events:	4		13			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.77 (P = 0.006)						
4.3.4 Above 12 months follow-up						
Bateman 1999 (1)	5	22	13	19	100.0%	0.33 [0.15 , 0.76]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.33 [0.15 , 0.76]**
Total events:	5		13			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.61 (P = 0.009)						

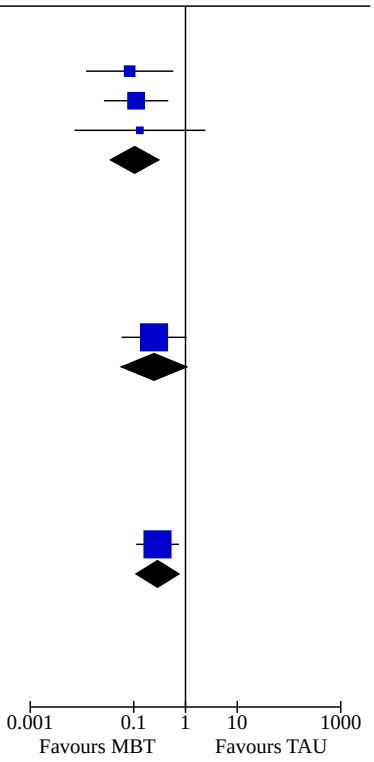


Footnotes

(1) SSHI - number of participants with self-mutilating behaviour (last 6 months) (CR)

Analysis 4.4. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 4: Primary: suicide-related outcomes (dichotomous)

Study or Subgroup	MBT Events	MBT Total	TAU Events	TAU Total	Weight	Risk Ratio M-H, Random, 95% CI
4.4.1 End of treatment						
Bateman 1999 (1)	1	19	12	19	30.5%	0.08 [0.01 , 0.58]
Bateman 2009 (1)	2	71	16	63	56.0%	0.11 [0.03 , 0.46]
Philips 2018 (2)	0	24	3	22	13.5%	0.13 [0.01 , 2.41]
Subtotal (95% CI)		**114**		**104**	**100.0%**	**0.10 [0.04 , 0.30]**
Total events:	3		31			
Heterogeneity: Tau² = 0.00; Chi² = 0.08, df = 2 (P = 0.96); I² = 0%						
Test for overall effect: Z = 4.14 (P < 0.0001)						
4.4.2 0-6 months follow-up						
Bateman 1999 (1)	2	22	7	19	100.0%	0.25 [0.06 , 1.05]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.25 [0.06 , 1.05]**
Total events:	2		7			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.90 (P = 0.06)						
4.4.3 Above 12 months follow-up						
Bateman 1999 (1)	4	22	12	19	100.0%	0.29 [0.11 , 0.74]
Subtotal (95% CI)		**22**		**19**	**100.0%**	**0.29 [0.11 , 0.74]**
Total events:	4		12			
Heterogeneity: Not applicable						
Test for overall effect: Z = 2.57 (P = 0.01)						
Test for subgroup differences: Chi² = 2.07, df = 2 (P = 0.35), I² = 3.4%						



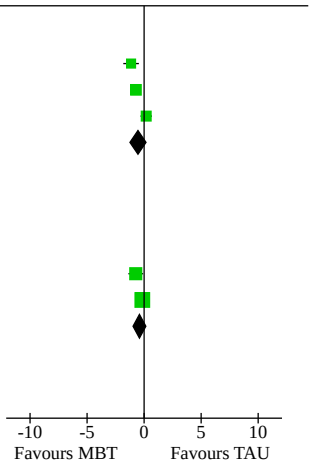
Footnotes

(1) SSHI - number of participants with life-threatening suicide attempts (last 6 months)

(2) participants with suicide attempts (recorded via direct contact with patients and health care staff, as well as from reviewing the case records)

Analysis 4.5. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 5: Primary: psychosocial functioning (continuous)

Study or Subgroup	MBT Mean	MBT SD	MBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
4.5.1 End of treatment								
Bateman 1999 (1)	2.7	0.6	20	3.4	0.6	19	29.4%	-1.14 [-1.83 , -0.46]
Bateman 2009 (1)	1.76	0.5	71	2.17	0.64	63	36.9%	-0.72 [-1.07 , -0.36]
Jørgensen 2013 (1)	2.2	0.5	42	2.1	0.6	24	33.7%	0.18 [-0.32 , 0.69]
Subtotal (95% CI)			**133**			**106**	**100.0%**	**-0.54 [-1.24 , 0.16]**
Heterogeneity: Tau² = 0.32; Chi² = 11.92, df = 2 (P = 0.003); I² = 83%								
Test for overall effect: Z = 1.50 (P = 0.13)								
4.5.2 Above 12 months follow-up								
Bateman 1999 (2)	-58.3	10.5	22	-51.8	5.7	18	43.7%	-0.73 [-1.38 , -0.09]
Jørgensen 2013 (1)	2.1	0.5	40	2.2	0.8	24	56.3%	-0.16 [-0.66 , 0.35]
Subtotal (95% CI)			**62**			**42**	**100.0%**	**-0.41 [-0.97 , 0.15]**
Heterogeneity: Tau² = 0.08; Chi² = 1.89, df = 1 (P = 0.17); I² = 47%								
Test for overall effect: Z = 1.43 (P = 0.15)								



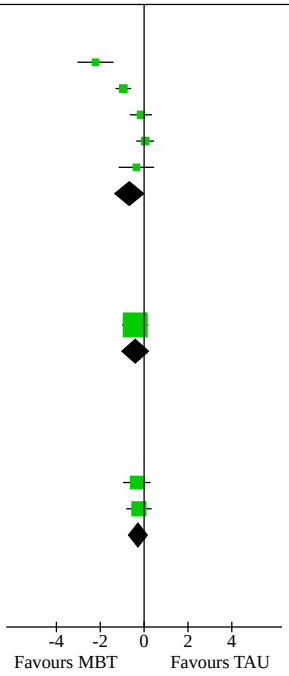
Footnotes

(1) SAS-SR (SR)

(2) Clinician rated: GAF

Analysis 4.6. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 6: Secondary: interpersonal problems (continuous)

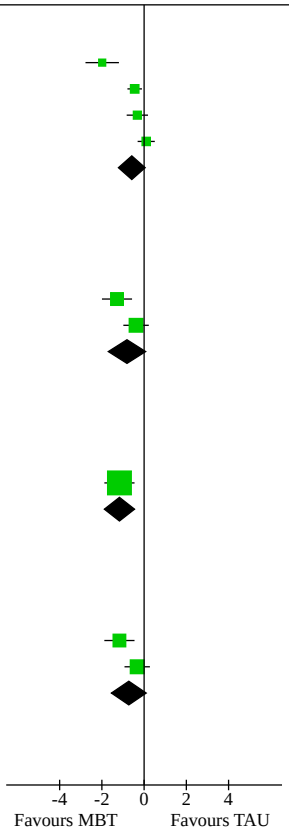
Study or Subgroup	MBT Mean	MBT SD	MBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
4.6.1 End of treatment								
Bateman 1999 (1)	1.86	0.36	19	2.6	0.29	19	17.3%	-2.22 [-3.04 , -1.39]
Bateman 2009 (1)	1.28	0.13	71	1.65	0.55	63	22.3%	-0.95 [-1.30 , -0.59]
Jørgensen 2013 (1)	1.2	0.6	42	1.3	0.8	24	21.0%	-0.15 [-0.65 , 0.36]
Laurenssen 2018 (1)	2.78	0.63	54	2.75	0.57	41	21.9%	0.05 [-0.36 , 0.46]
Philips 2018 (1)	1.5	0.54	13	1.7	0.56	11	17.5%	-0.35 [-1.16 , 0.46]
Subtotal (95% CI)			**199**			**158**	**100.0%**	**-0.68 [-1.33 , -0.02]**
Heterogeneity: Tau² = 0.47; Chi² = 31.45, df = 4 (P < 0.00001); I² = 87%								
Test for overall effect: Z = 2.02 (P = 0.04)								
4.6.2 0-6 months follow-up								
Jørgensen 2013 (1)	1.2	0.7	38	1.5	0.8	15	100.0%	-0.41 [-1.01 , 0.20]
Subtotal (95% CI)			**38**			**15**	**100.0%**	**-0.41 [-1.01 , 0.20]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.32 (P = 0.19)								
4.6.3 Above 12 months follow-up								
Bateman 1999 (1)	1.5	4	21	2.5	0.5	19	46.4%	-0.34 [-0.96 , 0.29]
Jørgensen 2013 (1)	1.2	0.8	40	1.4	0.9	16	53.6%	-0.24 [-0.82 , 0.34]
Subtotal (95% CI)			**61**			**35**	**100.0%**	**-0.28 [-0.71 , 0.14]**
Heterogeneity: Tau² = 0.00; Chi² = 0.05, df = 1 (P = 0.82); I² = 0%								
Test for overall effect: Z = 1.30 (P = 0.19)								



Footnotes
(1) IIP-64 (SR)

Analysis 4.7. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 7: Secondary: depression (continuous)

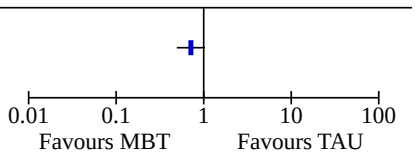
Study or Subgroup	MBT Mean	MBT SD	MBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
4.7.1 End of treatment								
Bateman 1999 (1)	20.6	7	19	35.2	7.4	19	20.4%	-1.98 [-2.78 , -1.19]
Bateman 2009 (1)	14.8	8.55	71	18.68	8.76	63	27.6%	-0.45 [-0.79 , -0.10]
Jørgensen 2013 (2)	18.8	11.5	42	22.8	13.7	24	25.2%	-0.32 [-0.83 , 0.18]
Laurenssen 2018 (3)	22.5	16.57	54	21.11	9.1	41	26.7%	0.10 [-0.31 , 0.51]
Subtotal (95% CI)			**186**			**147**	**100.0%**	**-0.58 [-1.22 , 0.05]**
Heterogeneity: Tau² = 0.35; Chi² = 21.33, df = 3 (P < 0.0001); I² = 86%								
Test for overall effect: Z = 1.81 (P = 0.07)								
4.7.2 0-6 months follow-up								
Bateman 1999 (4)	19	7.4	22	28.7	7.4	16	47.7%	-1.28 [-2.00 , -0.57]
Jørgensen 2013 (2)	17.8	14	38	23.2	13.9	15	52.3%	-0.38 [-0.98 , 0.22]
Subtotal (95% CI)			**60**			**31**	**100.0%**	**-0.81 [-1.69 , 0.07]**
Heterogeneity: Tau² = 0.29; Chi² = 3.60, df = 1 (P = 0.06); I² = 72%								
Test for overall effect: Z = 1.80 (P = 0.07)								
4.7.3 6-12 months follow-up								
Bateman 1999 (4)	13.3	6	22	21.5	8	15	100.0%	-1.17 [-1.88 , -0.45]
Subtotal (95% CI)			**22**			**15**	**100.0%**	**-1.17 [-1.88 , -0.45]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.21 (P = 0.001)								
4.7.4 Above 12 months follow-up								
Bateman 1999 (4)	11.9	3.3	22	20.4	10.5	15	47.3%	-1.17 [-1.88 , -0.45]
Jørgensen 2013 (4)	17.5	13.5	38	22.2	15.8	15	52.7%	-0.33 [-0.93 , 0.27]
Subtotal (95% CI)			**60**			**30**	**100.0%**	**-0.72 [-1.55 , 0.10]**
Heterogeneity: Tau² = 0.24; Chi² = 3.12, df = 1 (P = 0.08); I² = 68%								
Test for overall effect: Z = 1.72 (P = 0.08)								



Footnotes
(1) Self rated: BDI
(2) BDI-II (SR)
(3) Self-rated: BDI
(4) BDI (SR)

Analysis 4.8. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 8: Secondary: depression (dichotomous), at end of treatment

Study or Subgroup	MBT Events	MBT Total	TAU Events	TAU Total	Risk Ratio IV, Fixed, 95% CI
Rossouw 2012b (1)	20	40	28	40	0.71 [0.49 , 1.03]
Test for subgroup differences: Not applicable					

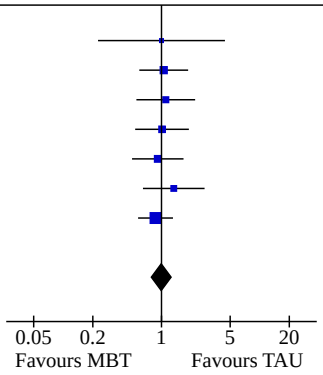


Footnotes
(1) MFQ - participants beyond depression cut-off

Analysis 4.9. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 9: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	MBT Events	MBT Total	TAU Events	TAU Total	Weight	Risk Ratio M-H, Random, 95% CI
Bateman 1999	3	22	3	22	2.4%	1.00 [0.23 , 4.42]
Bateman 2009	19	71	16	63	16.3%	1.05 [0.59 , 1.87]
Jørgensen 2013	19	58	8	27	11.2%	1.11 [0.56 , 2.20]
Laurenssen 2018	16	54	12	41	13.5%	1.01 [0.54 , 1.90]
Philips 2018	11	24	11	22	14.6%	0.92 [0.50 , 1.68]
Robinson 2016	12	34	9	34	10.2%	1.33 [0.65 , 2.74]
Rossouw 2012b	20	40	23	40	31.8%	0.87 [0.58 , 1.31]
Total (95% CI)		**303**		**249**	**100.0%**	**0.99 [0.79 , 1.25]**
Total events:	100		82			

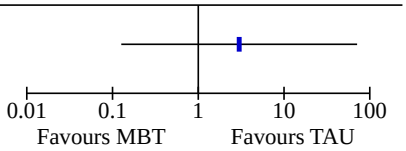
Heterogeneity: Tau² = 0.00; Chi² = 1.28, df = 6 (P = 0.97); I² = 0%
Test for overall effect: Z = 0.05 (P = 0.96)
Test for subgroup differences: Not applicable



Analysis 4.10. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 10: Secondary: adverse effects (dichotomous), at end of treatment

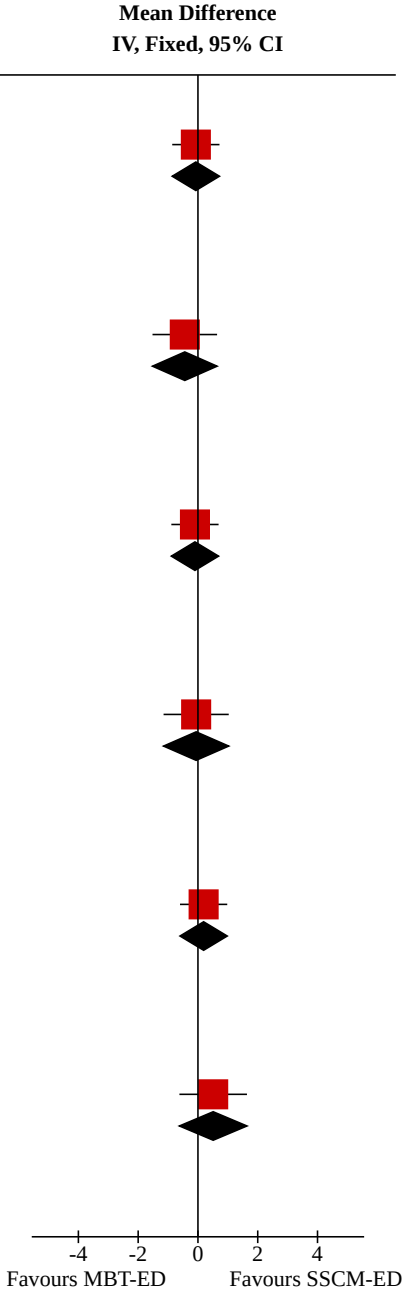
Study or Subgroup	MBT-ED Events	MBT-ED Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Robinson 2016	1	34	0	34	3.00 [0.13 , 71.15]

Test for subgroup differences: Not applicable



Analysis 4.11. Comparison 4: Mentalisation based therapy (MBT) vs TAU, Outcome 11: Mentalisation-based treatment for eating disorders (MBT-ED) versus specialist supportive clinical management (SSCM-ED) (generic inverse variance)

Study or Subgroup	MD	SE	Weight	Mean Difference IV, Fixed, 95% CI
4.11.1 Primary: psychosocial functioning (continuous), at end of treatment				
Robinson 2016 (1)	-0.07	0.4031	100.0%	-0.07 [-0.86 , 0.72]
Subtotal (95% CI)			**100.0%**	**-0.07 [-0.86 , 0.72]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.17 (P = 0.86)				
4.11.2 Primary: psychosocial functioning (dichotomous), at 0-6 months follow-up				
Robinson 2016 (1)	-0.44	0.551	100.0%	-0.44 [-1.52 , 0.64]
Subtotal (95% CI)			**100.0%**	**-0.44 [-1.52 , 0.64]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.80 (P = 0.42)				
4.11.3 Secondary: interpersonal problems (continuous), at end of treatment				
Robinson 2016 (2)	-0.1	0.4031	100.0%	-0.10 [-0.89 , 0.69]
Subtotal (95% CI)			**100.0%**	**-0.10 [-0.89 , 0.69]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.25 (P = 0.80)				
4.11.4 Secondary: interpersonal problems (continuous), at 0-6 months follow-up				
Robinson 2016 (3)	-0.06	0.5561	100.0%	-0.06 [-1.15 , 1.03]
Subtotal (95% CI)			**100.0%**	**-0.06 [-1.15 , 1.03]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.11 (P = 0.91)				
4.11.5 Secondary: depression (continuous), at end of treatment				
Robinson 2016 (4)	0.19	0.4031	100.0%	0.19 [-0.60 , 0.98]
Subtotal (95% CI)			**100.0%**	**0.19 [-0.60 , 0.98]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.47 (P = 0.64)				
4.11.6 Secondary: depression (continuous), at 0-6 months follow-up				
Robinson 2016 (4)	0.51	0.5765	100.0%	0.51 [-0.62 , 1.64]
Subtotal (95% CI)			**100.0%**	**0.51 [-0.62 , 1.64]**
Heterogeneity: Not applicable				
Test for overall effect: Z = 0.88 (P = 0.38)				



Footnotes

(1) Clinician-rated: GAF
(2) WHOQOL - social relationships (SR)
(3) EQ-5D - social relationships (SR)
(4) Self-reported: DASS-21

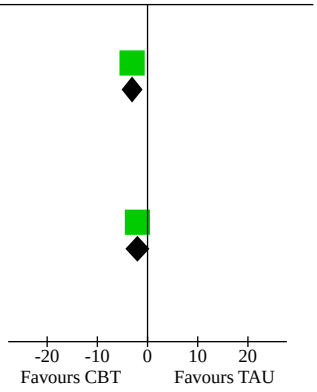
Comparison 5. Cognitive behavioural therapy (CBT) and related treatments vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
5.1 Primary: BPD symptom severity (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
5.1.1 End of treatment	1	26	Mean Difference (IV, Fixed, 95% CI)	-3.08 [-4.99, -1.17]
5.1.2 0-6 months follow-up	1	26	Mean Difference (IV, Fixed, 95% CI)	-2.02 [-4.23, 0.19]
5.2 Primary: BPD symptom severity (dichotomous), at above 12 months follow-up	1	76	Risk Ratio (IV, Fixed, 95% CI)	0.91 [0.56, 1.48]
5.3 Primary: self-harm (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
5.3.1 End of treatment	1	28	Mean Difference (IV, Fixed, 95% CI)	-3.03 [-5.68, -0.38]
5.3.2 0-6 months follow-up	1	28	Mean Difference (IV, Fixed, 95% CI)	-4.71 [-11.60, 2.18]
5.4 Primary: self-harm (dichotomous), at end of treatment	1		Risk Ratio (IV, Fixed, 95% CI)	Subtotals only
5.5 Primary: suicide-related outcomes (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
5.5.1 End of treatment	2	104	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-1.02, 0.08]
5.5.2 0-6 months follow-up	1	28	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-1.20, 0.31]
5.5.3 6-12 months follow-up	1	76	Std. Mean Difference (IV, Random, 95% CI)	-0.44 [-0.89, 0.02]
5.5.4 Above 12 months follow-up	1	76	Std. Mean Difference (IV, Random, 95% CI)	-0.31 [-0.77, 0.14]
5.6 Primary: psychosocial functioning (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
5.6.1 End of treatment	1	99	Std. Mean Difference (IV, Random, 95% CI)	0.00 [-0.39, 0.39]
5.6.2 6-12 months follow-up	1	90	Std. Mean Difference (IV, Random, 95% CI)	0.13 [-0.28, 0.55]
5.6.3 Above 12 months follow-up	2	209	Std. Mean Difference (IV, Random, 95% CI)	0.04 [-0.36, 0.43]
5.7 Secondary: interpersonal problems (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
5.7.1 End of treatment	1	99	Mean Difference (IV, Fixed, 95% CI)	5.40 [-3.70, 14.50]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
5.7.2 6-12 months follow-up	1	99	Mean Difference (IV, Fixed, 95% CI)	0.30 [-9.17, 9.77]
5.7.3 Above 12 months follow-up	1	76	Mean Difference (IV, Fixed, 95% CI)	11.70 [0.72, 22.68]
5.8 Secondary: dissociation and psychotic-like symptoms (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
5.8.1 End of treatment	1	26	Mean Difference (IV, Fixed, 95% CI)	-2.30 [-8.84, 4.24]
5.8.2 0-6 months follow-up	1	26	Mean Difference (IV, Fixed, 95% CI)	-13.40 [-24.49, -2.31]
5.9 Secondary: depression (continuous)	5		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
5.9.1 End of treatment	5	314	Std. Mean Difference (IV, Random, 95% CI)	-0.21 [-0.77, 0.35]
5.9.2 0-6 months follow-up	1	26	Std. Mean Difference (IV, Random, 95% CI)	-0.96 [-1.78, -0.14]
5.9.3 6-12 months follow-up	1	99	Std. Mean Difference (IV, Random, 95% CI)	-0.29 [-0.69, 0.11]
5.9.4 Above 12 months follow-up	2	197	Std. Mean Difference (IV, Random, 95% CI)	-0.15 [-0.43, 0.13]
5.10 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
5.11 Secondary: adverse effects (dichotomous), at end of treatment	2		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
5.11.1 Non-serious adverse effects	1	306	Risk Ratio (M-H, Random, 95% CI)	0.92 [0.45, 1.88]
5.11.2 Serious adverse effects	2	326	Risk Ratio (M-H, Random, 95% CI)	2.65 [0.31, 22.93]

Analysis 5.1. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 1: Primary: BPD symptom severity (continuous)

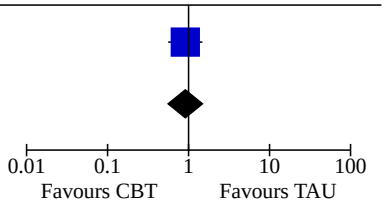
Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
5.1.1 End of treatment								
Kredlow 2017a (1)	1.17	1.17	14	4.25	3.2	12	100.0%	-3.08 [-4.99 , -1.17]
Subtotal (95% CI)			**14**			**12**	**100.0%**	**-3.08 [-4.99 , -1.17]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.16 (P = 0.002)								
5.1.2 0-6 months follow-up								
Kredlow 2017a (2)	2.86	2.7	14	4.88	3	12	100.0%	-2.02 [-4.23 , 0.19]
Subtotal (95% CI)			**14**			**12**	**100.0%**	**-2.02 [-4.23 , 0.19]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.79 (P = 0.07)								



Footnotes
(1) SCID-BPD (CR)
(2) Observer rated: SCID-II BPD

Analysis 5.2. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 2: Primary: BPD symptom severity (dichotomous), at above 12 months follow-up

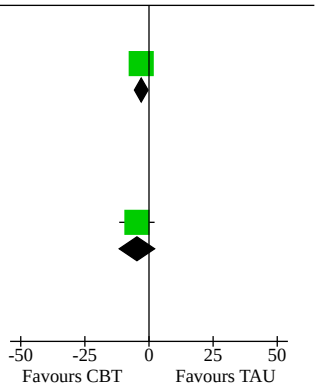
Study or Subgroup	CBT Events	CBT Total	TAU Events	TAU Total	Weight	Risk Ratio IV, Fixed, 95% CI
Davidson 2006 (1)	19	43	16	33	100.0%	0.91 [0.56 , 1.48]
Total (95% CI)		**43**		**33**	**100.0%**	**0.91 [0.56 , 1.48]**
Total events:	19		16			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.37 (P = 0.71)						
Test for subgroup differences: Not applicable						



Footnotes
(1) Participants still meeting BPD diagnostic criteria

Analysis 5.3. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 3: Primary: self-harm (continuous)

Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
5.3.1 End of treatment								
Weinberg 2006 (1)	0.6	0.91	15	3.63	4.8	13	100.0%	-3.03 [-5.68 , -0.38]
Subtotal (95% CI)			**15**			**13**	**100.0%**	**-3.03 [-5.68 , -0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.24 (P = 0.03)								
5.3.2 0-6 months follow-up								
Weinberg 2006 (1)	1.98	3.57	15	6.69	12.23	13	100.0%	-4.71 [-11.60 , 2.18]
Subtotal (95% CI)			**15**			**13**	**100.0%**	**-4.71 [-11.60 , 2.18]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.34 (P = 0.18)								

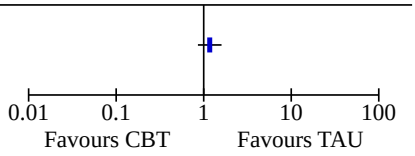


Footnotes

(1) PHI - deliberate self-harm frequency (CR)

Analysis 5.4. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 4: Primary: self-harm (dichotomous), at end of treatment

Study or Subgroup	CBT Events	CBT Total	TAU Events	TAU Total	Risk Ratio IV, Fixed, 95% CI
Davidson 2006 (1)	35	52	27	47	1.17 [0.86 , 1.60]
Test for subgroup differences: Not applicable					

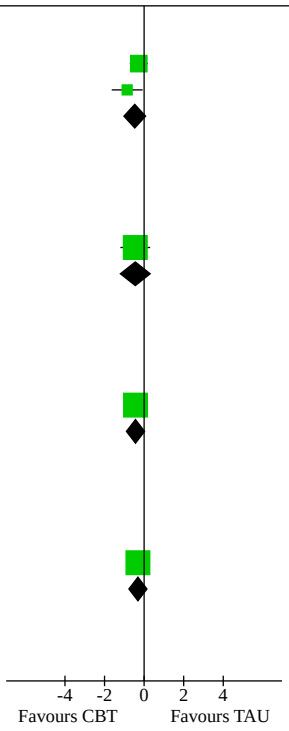


Footnotes

(1) DSHI - participants with self-harming behaviour (12 months of treatment) (SR)

Analysis 5.5. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 5: Primary: suicide-related outcomes (continuous)

Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
5.5.1 End of treatment								
Davidson 2006 (1)	0.69	1.14	43	1.22	2.67	33	65.2%	-0.27 [-0.72 , 0.19]
Weinberg 2006 (2)	27.47	16.92	15	42.69	17.67	13	34.8%	-0.86 [-1.64 , -0.07]
Subtotal (95% CI)			**58**			**46**	**100.0%**	**-0.47 [-1.02 , 0.08]**
Heterogeneity: Tau² = 0.07; Chi² = 1.62, df = 1 (P = 0.20); I² = 38%								
Test for overall effect: Z = 1.69 (P = 0.09)								
5.5.2 0-6 months follow-up								
Weinberg 2006 (2)	37.96	18.68	15	45.69	14.38	13	100.0%	-0.45 [-1.20 , 0.31]
Subtotal (95% CI)			**15**			**13**	**100.0%**	**-0.45 [-1.20 , 0.31]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.16 (P = 0.25)								
5.5.3 6-12 months follow-up								
Davidson 2006 (3)	0.93	1.58	43	2.09	3.58	33	100.0%	-0.44 [-0.89 , 0.02]
Subtotal (95% CI)			**43**			**33**	**100.0%**	**-0.44 [-0.89 , 0.02]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.86 (P = 0.06)								
5.5.4 Above 12 months follow-up								
Davidson 2006 (4)	1.88	3.19	43	3.03	4.16	33	100.0%	-0.31 [-0.77 , 0.14]
Subtotal (95% CI)			**43**			**33**	**100.0%**	**-0.31 [-0.77 , 0.14]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.34 (P = 0.18)								

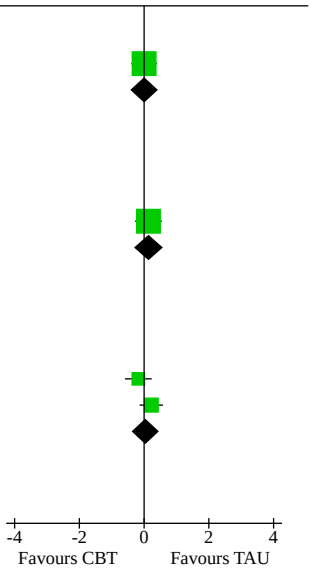


Footnotes

(1) DSHI - cumulative number of suicide attempts
(2) SBQ (SR)
(3) Number of suicide attempts (cumulative average at 12 months follow-up)
(4) Number of suicide attempts (cumulative average at 30 month follow-up)

Analysis 5.6. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 6: Primary: psychosocial functioning (continuous)

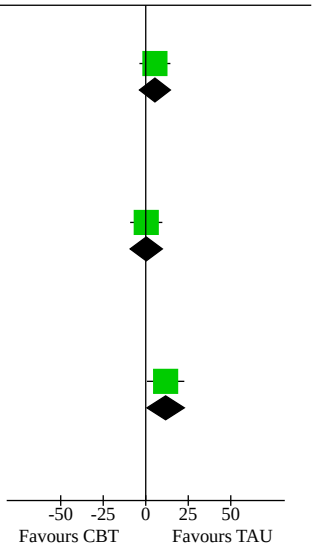
Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
5.6.1 End of treatment								
Davidson 2006 (1)	13.1	4.4	52	13.1	4.6	47	100.0%	0.00 [-0.39 , 0.39]
Subtotal (95% CI)			**52**			**47**	**100.0%**	**0.00 [-0.39 , 0.39]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								
5.6.2 6-12 months follow-up								
Davidson 2006 (1)	13	5	43	12.3	5.3	47	100.0%	0.13 [-0.28 , 0.55]
Subtotal (95% CI)			**43**			**47**	**100.0%**	**0.13 [-0.28 , 0.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.64 (P = 0.52)								
5.6.3 Above 12 months follow-up								
Davidson 2006 (1)	10.3	5	43	11.2	5	47	46.6%	-0.18 [-0.59 , 0.24]
McMurran 2016 (2)	14.1	6.7506	60	12.5	7.5895	59	53.4%	0.22 [-0.14 , 0.58]
Subtotal (95% CI)			**103**			**106**	**100.0%**	**0.04 [-0.36 , 0.43]**
Heterogeneity: Tau² = 0.04; Chi² = 2.04, df = 1 (P = 0.15); I² = 51%								
Test for overall effect: Z = 0.18 (P = 0.86)								



Footnotes
(1) Self rated: SFQ
(2) SFQ (SR)

Analysis 5.7. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 7: Secondary: interpersonal problems (continuous)

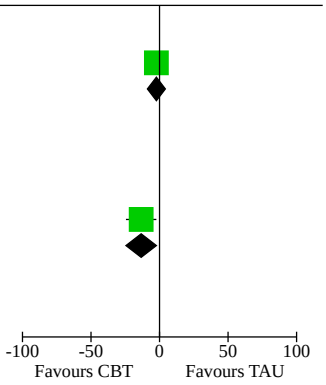
Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
5.7.1 End of treatment								
Davidson 2006 (1)	60.4	23.9	52	55	22.3	47	100.0%	5.40 [-3.70 , 14.50]
Subtotal (95% CI)			**52**			**47**	**100.0%**	**5.40 [-3.70 , 14.50]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.16 (P = 0.24)								
5.7.2 6-12 months follow-up								
Davidson 2006 (1)	54	23.9	52	53.7	24.1	47	100.0%	0.30 [-9.17 , 9.77]
Subtotal (95% CI)			**52**			**47**	**100.0%**	**0.30 [-9.17 , 9.77]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.06 (P = 0.95)								
5.7.3 Above 12 months follow-up								
Davidson 2006 (1)	60.4	23.7	43	48.7	24.6	33	100.0%	11.70 [0.72 , 22.68]
Subtotal (95% CI)			**43**			**33**	**100.0%**	**11.70 [0.72 , 22.68]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.09 (P = 0.04)								



Footnotes
(1) IIP-32 (SR)

Analysis 5.8. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 8: Secondary: dissociation and psychotic-like symptoms (continuous)

Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
5.8.1 End of treatment								
Kredlow 2017a (1)	39	8.7	14	41.3	8.3	12	100.0%	-2.30 [-8.84 , 4.24]
Subtotal (95% CI)			**14**			**12**	**100.0%**	**-2.30 [-8.84 , 4.24]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.69 (P = 0.49)								
5.8.2 0-6 months follow-up								
Kredlow 2017a (2)	42	7.6	14	55.4	18.3	12	100.0%	-13.40 [-24.49 , -2.31]
Subtotal (95% CI)			**14**			**12**	**100.0%**	**-13.40 [-24.49 , -2.31]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.37 (P = 0.02)								



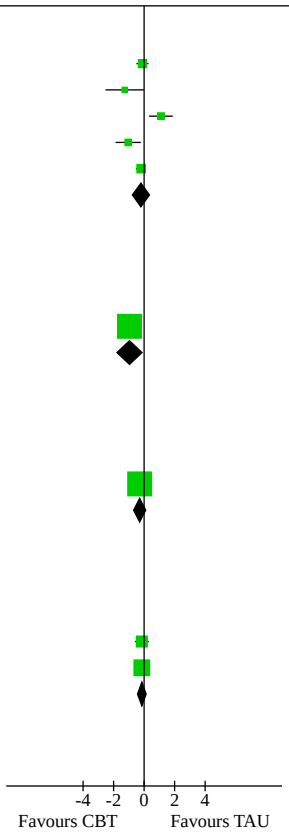
Footnotes

(1) BPRS (CR)

(2) Observer rated: BPRS, total

Analysis 5.9. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 9: Secondary: depression (continuous)

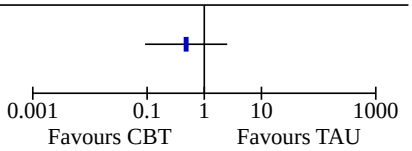
Study or Subgroup	CBT Mean	CBT SD	CBT Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
5.9.1 End of treatment								
Davidson 2006 (1)	29.6	14.8	52	31.3	16.6	47	25.4%	-0.11 [-0.50 , 0.29]
Davidson 2014 (2)	21.73	9.86	11	33.5	2.38	4	11.8%	-1.27 [-2.53 , -0.01]
Jahangard 2012 (3)	3.93	1.34	15	2.67	0.82	15	18.7%	1.10 [0.33 , 1.88]
Kredlow 2017a (1)	24.5	14.4	14	39.6	13.6	12	17.8%	-1.04 [-1.87 , -0.21]
McMurran 2016 (4)	24.6	7.4	80	26.3	9.6	64	26.4%	-0.20 [-0.53 , 0.13]
Subtotal (95% CI)			**172**			**142**	**100.0%**	**-0.21 [-0.77 , 0.35]**
Heterogeneity: Tau² = 0.28; Chi² = 17.62, df = 4 (P = 0.001); I² = 77%								
Test for overall effect: Z = 0.73 (P = 0.47)								
5.9.2 0-6 months follow-up								
Kredlow 2017a (5)	23.1	12.7	14	35.8	13	12	100.0%	-0.96 [-1.78 , -0.14]
Subtotal (95% CI)			**14**			**12**	**100.0%**	**-0.96 [-1.78 , -0.14]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.29 (P = 0.02)								
5.9.3 6-12 months follow-up								
Davidson 2006 (5)	26.5	14.8	52	31.1	16.6	47	100.0%	-0.29 [-0.69 , 0.11]
Subtotal (95% CI)			**52**			**47**	**100.0%**	**-0.29 [-0.69 , 0.11]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.44 (P = 0.15)								
5.9.4 Above 12 months follow-up								
Davidson 2006 (5)	26.5	15.3	43	28.8	15.7	33	38.6%	-0.15 [-0.60 , 0.31]
McMurran 2016 (4)	20.3	10.7	69	22	12.1	52	61.4%	-0.15 [-0.51 , 0.21]
Subtotal (95% CI)			**112**			**85**	**100.0%**	**-0.15 [-0.43 , 0.13]**
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.99); I² = 0%								
Test for overall effect: Z = 1.03 (P = 0.30)								



Footnotes
(1) BDI-II (SR)
(2) HADS - total score (SR)
(3) HDRS (CR)
(4) HADS (SR)
(5) Self rated: BDI-II

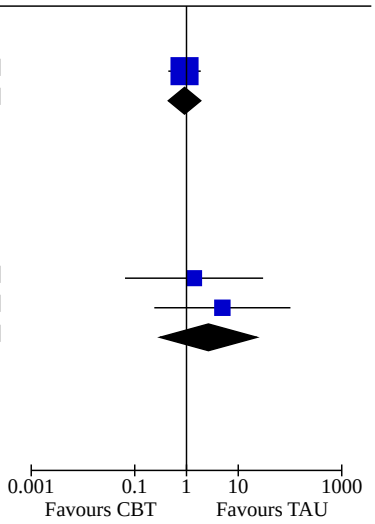
Analysis 5.10. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 10: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	CBT Events	CBT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Davidson 2006	2	54	4	52	0.48 [0.09 , 2.52]
Test for subgroup differences: Not applicable					



Analysis 5.11. Comparison 5: Cognitive behavioural therapy (CBT) and related treatments vs TAU, Outcome 11: Secondary: adverse effects (dichotomous), at end of treatment

Study or Subgroup	CBT Events	CBT Total	TAU Events	TAU Total	Weight	Risk Ratio M-H, Random, 95% CI
5.11.1 Non-serious adverse effects						
McMurran 2016 (1)	13	154	14	152	100.0%	0.92 [0.45 , 1.88]
Subtotal (95% CI)		**154**		**152**	**100.0%**	**0.92 [0.45 , 1.88]**
Total events:	13		14			
Heterogeneity: Not applicable						
Test for overall effect: Z = 0.24 (P = 0.81)						
5.11.2 Serious adverse effects						
Davidson 2014 (2)	1	14	0	6	49.3%	1.40 [0.06 , 30.23]
McMurran 2016 (2)	2	154	0	152	50.7%	4.94 [0.24 , 101.96]
Subtotal (95% CI)		**168**		**158**	**100.0%**	**2.65 [0.31 , 22.93]**
Total events:	3		0			
Heterogeneity: Tau² = 0.00; Chi² = 0.33, df = 1 (P = 0.56); I² = 0%						
Test for overall effect: Z = 0.89 (P = 0.38)						



Footnotes

(1) number of adverse event reports other than suicide or hospitalization

(2) commited suicide

Comparison 6. Psychodynamic psychotherapy vs TAU

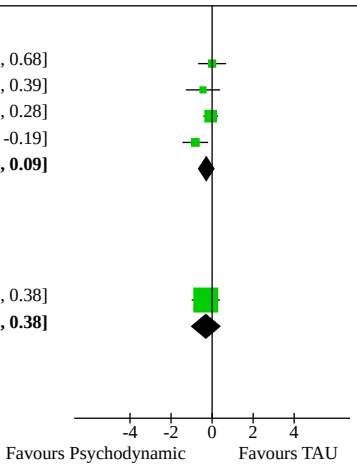
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
6.1 Primary: BPD symptom severity (continuous)	4		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.1.1 End of treatment	4	222	Std. Mean Difference (IV, Random, 95% CI)	-0.29 [-0.66, 0.09]
6.1.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.31 [-1.00, 0.38]
6.2 Primary: self-harm (continuous)	1		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.2.1 End of treatment	1	33	Std. Mean Difference (IV, Random, 95% CI)	0.12 [-0.56, 0.80]
6.2.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	0.14 [-0.55, 0.82]
6.3 Primary: suicide-related outcomes (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.3.1 End of treatment	3	101	Std. Mean Difference (IV, Random, 95% CI)	-0.22 [-0.62, 0.17]
6.3.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-1.07, 0.31]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
6.4 Primary: psychosocial functioning (continuous)	4		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.4.1 End of treatment	4	140	Std. Mean Difference (IV, Random, 95% CI)	-0.69 [-1.98, 0.59]
6.4.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	0.05 [-0.64, 0.73]
6.4.3 Above 12 months follow-up	1	16	Std. Mean Difference (IV, Random, 95% CI)	-0.40 [-1.39, 0.60]
6.5 Secondary: anger (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
6.5.1 End of treatment	1	33	Mean Difference (IV, Fixed, 95% CI)	0.00 [-0.86, 0.86]
6.5.2 6-12 months follow-up	1	33	Mean Difference (IV, Fixed, 95% CI)	0.00 [-0.89, 0.89]
6.6 Secondary: affective instability (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.6.1 End of treatment	3	116	Std. Mean Difference (IV, Random, 95% CI)	-0.50 [-0.87, -0.13]
6.6.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-1.21, 0.18]
6.7 Secondary: chronic feelings of emptiness (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.7.1 End of treatment	2	77	Std. Mean Difference (IV, Random, 95% CI)	-0.49 [-1.02, 0.04]
6.7.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.58 [-1.28, 0.11]
6.8 Secondary: impulsivity (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.8.1 End of treatment	2	77	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.85, 0.07]
6.8.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	0.35 [-0.34, 1.04]
6.9 Secondary: interpersonal problems (continuous)	4		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.9.1 End of treatment	4	238	Std. Mean Difference (IV, Random, 95% CI)	-0.21 [-0.71, 0.29]
6.9.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.51 [-1.20, 0.19]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
6.10 Secondary: abandonment (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
6.10.1 End of treatment	1	33	Mean Difference (IV, Fixed, 95% CI)	-0.20 [-0.95, 0.55]
6.10.2 6-12 months follow-up	1	33	Mean Difference (IV, Fixed, 95% CI)	-0.40 [-1.08, 0.28]
6.11 Secondary: identity disturbance (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.11.1 End of treatment	3	199	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-1.02, 0.27]
6.11.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-1.09 [-1.83, -0.35]
6.12 Secondary: dissociation and psychotic-like symptoms (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.12.1 End of treatment	2	57	Std. Mean Difference (IV, Random, 95% CI)	-0.18 [-0.96, 0.60]
6.12.2 6-12 months follow-up	1	33	Std. Mean Difference (IV, Random, 95% CI)	-0.59 [-1.29, 0.11]
6.12.3 Above 12 months follow-up	1	24	Std. Mean Difference (IV, Random, 95% CI)	-0.01 [-0.81, 0.79]
6.13 Secondary: depression (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
6.13.1 End of treatment	3	190	Std. Mean Difference (IV, Random, 95% CI)	-0.17 [-0.81, 0.47]
6.13.2 Above 12 months follow-up	1	24	Std. Mean Difference (IV, Random, 95% CI)	-0.68 [-1.51, 0.15]
6.14 Secondary: attrition (dichotomous), at end of treatment	3	210	Risk Ratio (M-H, Random, 95% CI)	0.90 [0.56, 1.47]

Analysis 6.1. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 1: Primary: BPD symptom severity (continuous)

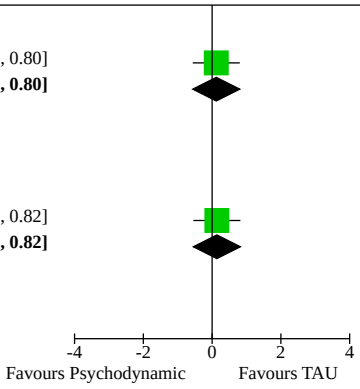
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.1.1 End of treatment								
Amianto 2011 (1)	3.3	1	16	3.3	1.1	17	20.5%	0.00 [-0.68 , 0.68]
Gregory 2008b (2)	33.6	12.4	10	38.4	8.62	13	15.3%	-0.44 [-1.28 , 0.39]
Leichsenring 2016 (3)	18.76	8.6	64	19.41	9.38	58	41.2%	-0.07 [-0.43 , 0.28]
Reneses 2013 (4)	13	7.9	18	19.1	6.9	26	23.0%	-0.82 [-1.45 , -0.19]
Subtotal (95% CI)			**108**			**114**	**100.0%**	**-0.29 [-0.66 , 0.09]**
Heterogeneity: Tau² = 0.06; Chi² = 4.83, df = 3 (P = 0.18); I² = 38%								
Test for overall effect: Z = 1.50 (P = 0.13)								
6.1.2 6-12 months follow-up								
Amianto 2011 (1)	3.1	1	16	3.4	0.9	17	100.0%	-0.31 [-1.00 , 0.38]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.31 [-1.00 , 0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.88 (P = 0.38)								



Footnotes
(1) Clinician rated: CGI-BPD
(2) BEST (SR)
(3) Self rated: Borderline Personality Inventory
(4) Clinician rated: ZAN-BPD

Analysis 6.2. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 2: Primary: self-harm (continuous)

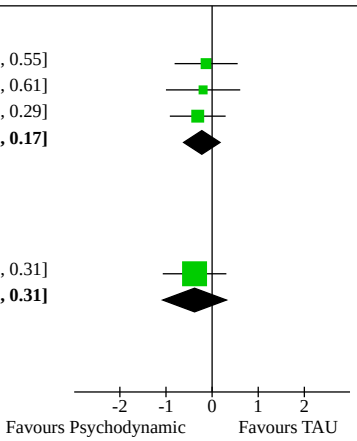
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.2.1 End of treatment								
Amianto 2011 (1)	2.2	2.8	16	1.9	2	17	100.0%	0.12 [-0.56 , 0.80]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.12 [-0.56 , 0.80]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.35 (P = 0.73)								
6.2.2 6-12 months follow-up								
Amianto 2011 (1)	0.4	0.8	16	0.3	0.6	17	100.0%	0.14 [-0.55 , 0.82]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.14 [-0.55 , 0.82]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.40 (P = 0.69)								



Footnotes
(1) self-harming incidents

Analysis 6.3. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 3: Primary: suicide-related outcomes (continuous)

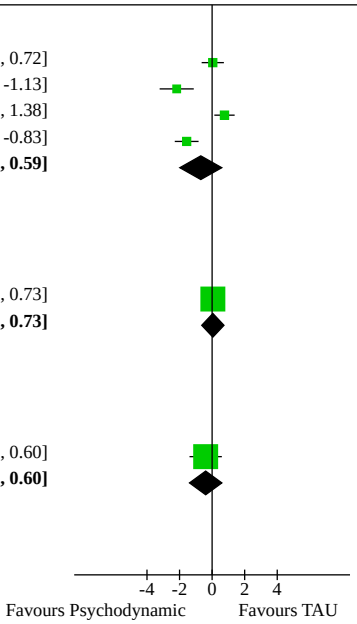
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.3.1 End of treatment								
Amianto 2011 (1)	1.4	0.7	16	1.5	0.8	17	33.4%	-0.13 [-0.81 , 0.55]
Gregory 2008b (2)	0.32	0.64	11	0.44	0.55	13	24.0%	-0.20 [-1.00 , 0.61]
Reneses 2013 (3)	0.9	1.2	18	1.3	1.3	26	42.6%	-0.31 [-0.92 , 0.29]
Subtotal (95% CI)			**45**			**56**	**100.0%**	**-0.22 [-0.62 , 0.17]**
Heterogeneity: Tau² = 0.00; Chi² = 0.16, df = 2 (P = 0.92); I² = 0%								
Test for overall effect: Z = 1.11 (P = 0.27)								
6.3.2 6-12 months follow-up								
Amianto 2011 (4)	1.4	0.6	16	1.7	0.9	17	100.0%	-0.38 [-1.07 , 0.31]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.38 [-1.07 , 0.31]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.08 (P = 0.28)								



Footnotes
(1) CGI-BPD, suicidality and self-damaging acts (CR)
(2) LPC - parasuicides per last 3 months
(3) Clinician rated: LSASI
(4) Clinician rated: CGI-BPD, suicidality and self-damaging acts

Analysis 6.4. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 4: Primary: psychosocial functioning (continuous)

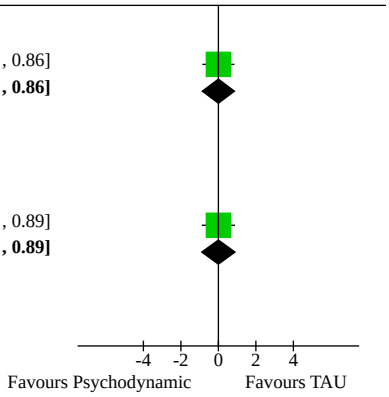
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.4.1 End of treatment								
Amianto 2011 (1)	-65.9	11.2	16	-66.4	13	17	25.6%	0.04 [-0.64 , 0.72]
Gregory 2008b (2)	-9.7	8.1	11	6.9	6.7	13	23.3%	-2.17 [-3.22 , -1.13]
Reneses 2013 (3)	35.4	8.9	18	27.6	10.8	26	25.9%	0.76 [0.14 , 1.38]
Salzer 2014 (4)	-65	9.84	17	-51.82	6.82	22	25.3%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**62**			**78**	**100.0%**	**-0.69 [-1.98 , 0.59]**
Heterogeneity: Tau² = 1.57; Chi² = 35.63, df = 3 (P < 0.00001); I² = 92%								
Test for overall effect: Z = 1.06 (P = 0.29)								
6.4.2 6-12 months follow-up								
Amianto 2011 (1)	-65.6	13.4	16	-66.2	11.9	17	100.0%	0.05 [-0.64 , 0.73]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.05 [-0.64 , 0.73]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.13 (P = 0.89)								
6.4.3 Above 12 months follow-up								
Gregory 2008b (2)	-14.3	8.7	8	-10.6	9	8	100.0%	-0.40 [-1.39 , 0.60]
Subtotal (95% CI)			**8**			**8**	**100.0%**	**-0.40 [-1.39 , 0.60]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.78 (P = 0.44)								



Footnotes
(1) Clinician rated: GAF
(2) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(3) Self reported: SAS-SR (higher scores indicate poorer functioning)
(4) GAF (CR)

Analysis 6.5. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 5: Secondary: anger (continuous)

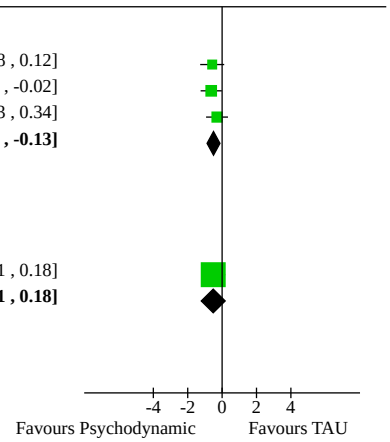
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
6.5.1 End of treatment								
Amianto 2011 (1)	2.6	1.1	16	2.6	1.4	17	100.0%	0.00 [-0.86 , 0.86]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.00 [-0.86 , 0.86]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								
6.5.2 6-12 months follow-up								
Amianto 2011 (2)	2.4	1.3	16	2.4	1.3	17	100.0%	0.00 [-0.89 , 0.89]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.00 [-0.89 , 0.89]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								



Footnotes
(1) Clinician rated: CGI-BPD – anger reaction
(2) Clinician rated: CGI-BPD

Analysis 6.6. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 6: Secondary: affective instability (continuous)

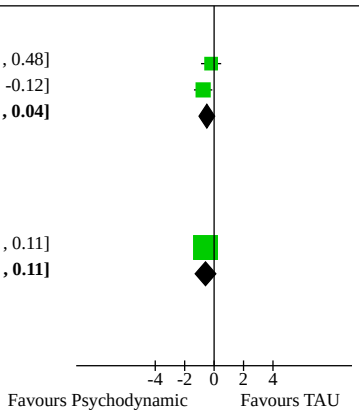
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.6.1 End of treatment								
Amianto 2011 (1)	2.2	0.9	16	2.9	1.4	17	28.7%	-0.58 [-1.28 , 0.12]
Reneses 2013 (2)	1.9	1.2	18	2.6	1	26	36.8%	-0.63 [-1.25 , -0.02]
Salzer 2014 (3)	4.71	3.35	17	5.55	2.26	22	34.5%	-0.30 [-0.93 , 0.34]
Subtotal (95% CI)			**51**			**65**	**100.0%**	**-0.50 [-0.87 , -0.13]**
Heterogeneity: Tau² = 0.00; Chi² = 0.62, df = 2 (P = 0.73); I² = 0%								
Test for overall effect: Z = 2.62 (P = 0.009)								
6.6.2 6-12 months follow-up								
Amianto 2011 (1)	2.1	1.1	16	2.8	1.5	17	100.0%	-0.52 [-1.21 , 0.18]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.52 [-1.21 , 0.18]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.46 (P = 0.15)								



Footnotes
(1) Clinician rated: CGI-BPD, affective instability
(2) Clinician rated: ZAN-BPD, affective instability
(3) Strengths and Difficulties Questionnaire - emotional problems (SR)

Analysis 6.7. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 7: Secondary: chronic feelings of emptiness (continuous)

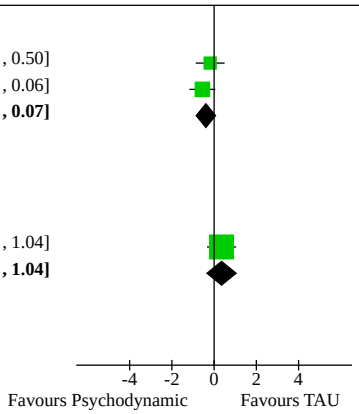
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.7.1 End of treatment								
Amianto 2011 (1)	2.6	1.1	16	2.8	0.8	17	46.4%	-0.20 [-0.89 , 0.48]
Reneses 2013 (2)	1.8	1.3	18	2.7	1.1	26	53.6%	-0.75 [-1.37 , -0.12]
Subtotal (95% CI)			**34**			**43**	**100.0%**	**-0.49 [-1.02 , 0.04]**
Heterogeneity: Tau² = 0.04; Chi² = 1.32, df = 1 (P = 0.25); I² = 24%								
Test for overall effect: Z = 1.83 (P = 0.07)								
6.7.2 6-12 months follow-up								
Amianto 2011 (3)	2.2	1.1	16	2.8	0.9	17	100.0%	-0.58 [-1.28 , 0.11]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.58 [-1.28 , 0.11]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.64 (P = 0.10)								



Footnotes
(1) Clinician rated: CGI-BPD
(2) Clinician rated: Zan-BPD, feeling of emptiness
(3) Clinician rated: CGI-BPD, emptiness

Analysis 6.8. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 8: Secondary: impulsivity (continuous)

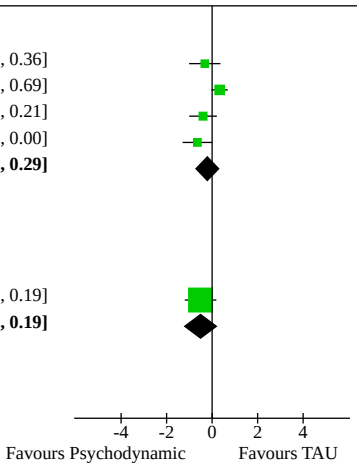
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.8.1 End of treatment								
Amianto 2011 (1)	1.8	1.1	16	2	1	17	44.5%	-0.19 [-0.87 , 0.50]
Reneses 2013 (2)	1.6	1.3	18	2.3	1.2	26	55.5%	-0.55 [-1.17 , 0.06]
Subtotal (95% CI)			**34**			**43**	**100.0%**	**-0.39 [-0.85 , 0.07]**
Heterogeneity: Tau² = 0.00; Chi² = 0.62, df = 1 (P = 0.43); I² = 0%								
Test for overall effect: Z = 1.67 (P = 0.09)								
6.8.2 6-12 months follow-up								
Amianto 2011 (3)	2.3	0.5	16	2.1	0.6	17	100.0%	0.35 [-0.34 , 1.04]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.35 [-0.34 , 1.04]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.00 (P = 0.32)								



Footnotes
(1) Clinician rated: CGI-BPD
(2) Clinician rated: ZAN-BPD, impulsivity
(3) Clinician rated: CGI-BPD, impulsivity

Analysis 6.9. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 9: Secondary: interpersonal problems (continuous)

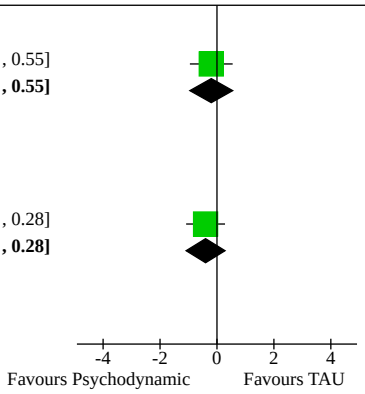
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.9.1 End of treatment								
Amianto 2011 (1)	2.4	1.1	16	2.8	1.3	17	21.8%	-0.32 [-1.01 , 0.36]
Leichsenring 2016 (2)	13.21	4.49	64	11.57	5.37	58	31.4%	0.33 [-0.03 , 0.69]
Reneses 2013 (3)	1.9	1.1	18	2.3	0.9	26	24.0%	-0.40 [-1.01 , 0.21]
Salzer 2014 (4)	2.76	1.72	17	3.95	1.86	22	22.8%	-0.65 [-1.30 , 0.00]
Subtotal (95% CI)			**115**			**123**	**100.0%**	**-0.21 [-0.71 , 0.29]**
Heterogeneity: Tau² = 0.17; Chi² = 9.46, df = 3 (P = 0.02); I² = 68%								
Test for overall effect: Z = 0.83 (P = 0.41)								
6.9.2 6-12 months follow-up								
Amianto 2011 (1)	2.2	1.1	16	2.8	1.2	17	100.0%	-0.51 [-1.20 , 0.19]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.51 [-1.20 , 0.19]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.43 (P = 0.15)								



Footnotes
(1) Clinician rated: CGI-BPD, disturbed relationships
(2) IIP-64 (SR)
(3) Clinician rated: ZAN-BPD, disturbed relationships
(4) Strengths and Difficulties Questionnaire - problems in relationships (SR)

Analysis 6.10. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 10: Secondary: abandonment (continuous)

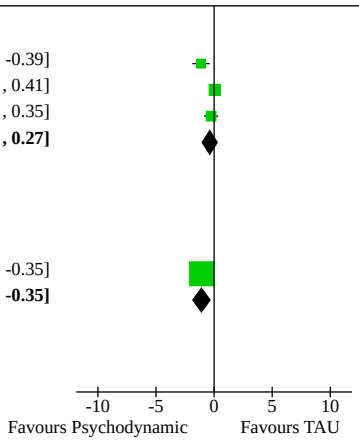
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
6.10.1 End of treatment								
Amianto 2011 (1)	2.4	1.1	16	2.6	1.1	17	100.0%	-0.20 [-0.95 , 0.55]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.20 [-0.95 , 0.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.52 (P = 0.60)								
6.10.2 6-12 months follow-up								
Amianto 2011 (2)	2.3	1	16	2.7	1	17	100.0%	-0.40 [-1.08 , 0.28]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.40 [-1.08 , 0.28]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.15 (P = 0.25)								



Footnotes
(1) Clinician rated: CGI-BPD
(2) Clinician rated: CGI-BPD, fear of abandoment

Analysis 6.11. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 11: Secondary: identity disturbance (continuous)

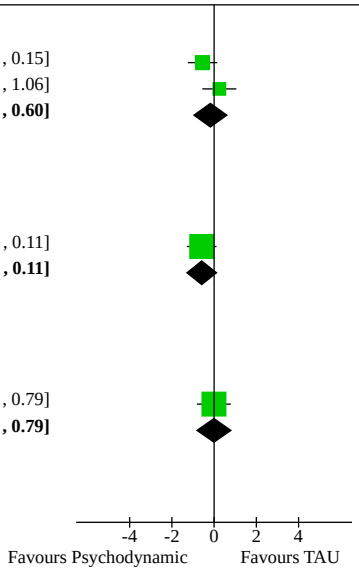
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.11.1 End of treatment								
Amianto 2011 (1)	2.2	0.1	16	3.2	1.2	17	28.2%	-1.13 [-1.87 , -0.39]
Leichsenring 2016 (2)	4.45	2.9	64	4.28	2.91	58	39.6%	0.06 [-0.30 , 0.41]
Reneses 2013 (3)	2	1.2	18	2.3	1.1	26	32.2%	-0.26 [-0.86 , 0.35]
Subtotal (95% CI)			**98**			**101**	**100.0%**	**-0.38 [-1.02 , 0.27]**
Heterogeneity: Tau² = 0.24; Chi² = 8.06, df = 2 (P = 0.02); I² = 75%								
Test for overall effect: Z = 1.15 (P = 0.25)								
6.11.2 6-12 months follow-up								
Amianto 2011 (4)	2	1.2	16	3.4	1.3	17	100.0%	-1.09 [-1.83 , -0.35]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-1.09 [-1.83 , -0.35]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.90 (P = 0.004)								



Footnotes
(1) Clinician rated: CGI-BPD identity distortion
(2) Self reported: BPI
(3) Clinician rated: Zan-BPD, identity
(4) Clinician rated: CGI-BPD, identity distortion

Analysis 6.12. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 12: Secondary: dissociation and psychotic-like symptoms (continuous)

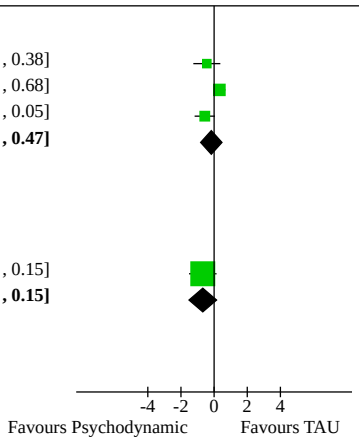
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.12.1 End of treatment								
Amianto 2011 (1)	1.6	0.9	16	2.3	1.5	17	53.4%	-0.55 [-1.25 , 0.15]
Gregory 2008b (2)	27.7	21.4	11	22.3	20.6	13	46.6%	0.25 [-0.56 , 1.06]
Subtotal (95% CI)			**27**			**30**	**100.0%**	**-0.18 [-0.96 , 0.60]**
Heterogeneity: Tau² = 0.17; Chi² = 2.14, df = 1 (P = 0.14); I² = 53%								
Test for overall effect: Z = 0.44 (P = 0.66)								
6.12.2 6-12 months follow-up								
Amianto 2011 (3)	1.4	1	16	2.1	1.3	17	100.0%	-0.59 [-1.29 , 0.11]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**-0.59 [-1.29 , 0.11]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.64 (P = 0.10)								
6.12.3 Above 12 months follow-up								
Gregory 2008b (4)	28.4	28.9	11	28.6	18.7	13	100.0%	-0.01 [-0.81 , 0.79]
Subtotal (95% CI)			**11**			**13**	**100.0%**	**-0.01 [-0.81 , 0.79]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.02 (P = 0.98)								



Footnotes
(1) Clinician rated: CGI-BPD dissociative symptoms
(2) DES (SR)
(3) Clinician rated: CGI-BPD, dissociative symptoms
(4) Self rated: DES

Analysis 6.13. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 13: Secondary: depression (continuous)

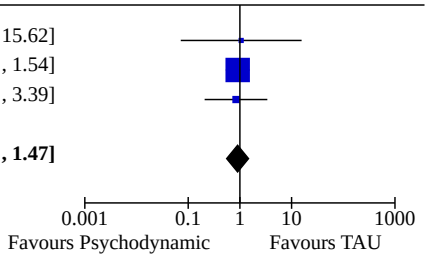
Study or Subgroup	Psychodynamic Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
6.13.1 End of treatment								
Gregory 2008b (1)	21	11.4	11	25.1	6.4	13	26.6%	-0.44 [-1.25 , 0.38]
Leichsenring 2016 (2)	27.95	10.75	64	24.39	11.21	58	40.7%	0.32 [-0.04 , 0.68]
Reneses 2013 (3)	15.9	13.2	18	22.8	11.2	26	32.7%	-0.56 [-1.18 , 0.05]
Subtotal (95% CI)			**93**			**97**	**100.0%**	**-0.17 [-0.81 , 0.47]**
Heterogeneity: Tau² = 0.23; Chi² = 7.42, df = 2 (P = 0.02); I² = 73%								
Test for overall effect: Z = 0.52 (P = 0.61)								
6.13.2 Above 12 months follow-up								
Gregory 2008b (4)	16	11.5	11	23.8	10.6	13	100.0%	-0.68 [-1.51 , 0.15]
Subtotal (95% CI)			**11**			**13**	**100.0%**	**-0.68 [-1.51 , 0.15]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.61 (P = 0.11)								



Footnotes
(1) BDI (SR)
(2) Clinician rated: BDI
(3) Clinician rated: MADRS
(4) Self rated: BDI

Analysis 6.14. Comparison 6: Psychodynamic psychotherapy vs TAU, Outcome 14: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	Psychodynamic Events	Total	TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Amianto 2011	1	17	1	18	3.3%	1.06 [0.07 , 15.62]
Leichsenring 2016 (1)	19	64	19	58	84.7%	0.91 [0.53 , 1.54]
Reneses 2013	3	25	4	28	12.1%	0.84 [0.21 , 3.39]
Total (95% CI)		**106**		**104**	**100.0%**	**0.90 [0.56 , 1.47]**
Total events:	23		24			
Heterogeneity: Tau² = 0.00; Chi² = 0.02, df = 2 (P = 0.99); I² = 0%						
Test for overall effect: Z = 0.41 (P = 0.68)						
Test for subgroup differences: Not applicable						



Footnotes
(1) lost to follow-up for any reason

Comparison 7. Schema-focused therapy (SFT) vs TAU

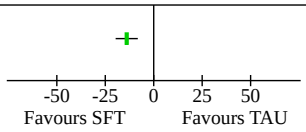
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
7.1 Primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.2 Primary: psychosocial functioning (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
7.3 Secondary: affective instability (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.4 Secondary: impulsivity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.5 Secondary: interpersonal problems (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.6 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
7.7 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 7.1. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

	SFT			TAU			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Farrell 2009 (1)	18.81	9.47	16	32.75	5.9	12	-13.94 [-19.66 , -8.22]	

Test for subgroup differences: Not applicable

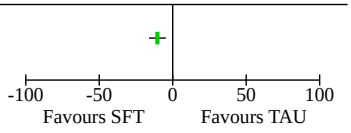


Footnotes
(1) Self rated: BSI

Analysis 7.2. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 2: Primary: psychosocial functioning (continuous), at end of treatment

	SFT			TAU			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Farrell 2009 (1)	-60.5	10.17	16	-50.08	5.07	12	-10.42 [-16.17 , -4.67]	

Test for subgroup differences: Not applicable

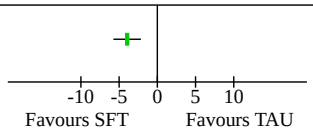


Footnotes
(1) Clinician rated: GAF

Analysis 7.3. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 3: Secondary: affective instability (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Farrell 2009 (1)	5.88	3.44	16	9.83	1.12	12	-3.95 [-5.75 , -2.15]

Test for subgroup differences: Not applicable

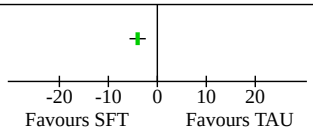


Footnotes
(1) Clinician rated: DIB-R, affect

Analysis 7.4. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 4: Secondary: impulsivity (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Farrell 2009 (1)	1.56	1.37	16	5.58	2.68	12	-4.02 [-5.68 , -2.36]

Test for subgroup differences: Not applicable

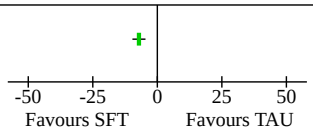


Footnotes
(1) Clinician rated: DIB-R, impulses

Analysis 7.5. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 5: Secondary: interpersonal problems (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Farrell 2009 (1)	4.88	4.02	16	12	2.8	12	-7.12 [-9.65 , -4.59]

Test for subgroup differences: Not applicable

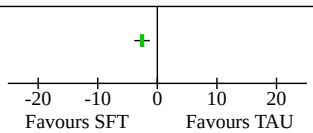


Footnotes
(1) Clinician rated: DIB-R, interpersonal

Analysis 7.6. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 6: Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Farrell 2009 (1)	1.69	2.02	16	4.25	1.49	12	-2.56 [-3.86 , -1.26]

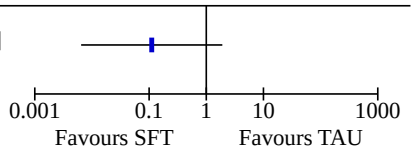
Test for subgroup differences: Not applicable



Footnotes
(1) Clinician rated: DIB-R cognition

Analysis 7.7. Comparison 7: Schema-focused therapy (SFT) vs TAU, Outcome 7: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	SFT Events	SFT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Farrell 2009	0	16	4	16	0.11 [0.01 , 1.91]
Test for subgroup differences: Not applicable					



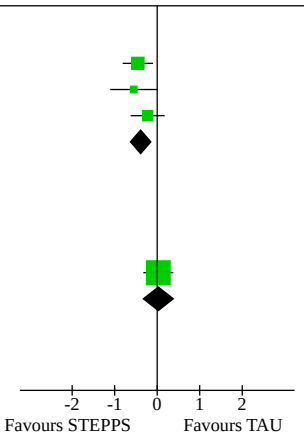
Comparison 8. Systems training for emotional predictability and problem solving (STEPPS) vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
8.1 Primary: BPD symptom severity (continuous), at end of treatment	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
8.1.1 End of treatment	3	273	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.63, -0.15]
8.1.2 6-12 months follow-up	1	124	Std. Mean Difference (IV, Random, 95% CI)	0.03 [-0.33, 0.38]
8.2 Primary: self-harm (dichtomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
8.3 Primary: psychosocial functioning (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8.3.1 End of treatment	1	124	Mean Difference (IV, Fixed, 95% CI)	-7.00 [-11.43, -2.57]
8.3.2 6-12 months follow-up	1	124	Mean Difference (IV, Fixed, 95% CI)	-5.90 [-12.49, 0.69]
8.4 Secondary: affective instability (continuous), at end of treatment	2	221	Std. Mean Difference (IV, Random, 95% CI)	-0.25 [-0.52, 0.02]
8.5 Secondary: impulsivity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8.6 Secondary: impulsivity (dichotomous), at end of treatment	1		Risk Ratio (IV, Fixed, 95% CI)	Subtotals only
8.7 Secondary: interpersonal problems (continuous), at end of treatment	2	177	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-0.67, -0.08]
8.8 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
8.9 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
8.9.1 End of treatment	1	124	Mean Difference (IV, Fixed, 95% CI)	-3.80 [-9.34, 1.74]
8.9.2 6-12 months follow-up	1	124	Mean Difference (IV, Fixed, 95% CI)	0.60 [-8.42, 9.62]
8.10 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 8.1. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

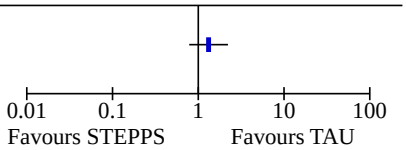
Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
8.1.1 End of treatment								
Blum 2008 (1)	9.8	8.0623	65	13.4	7.6811	59	45.2%	-0.45 [-0.81 , -0.10]
Bos 2010 (2)	79.7	25.8	26	95.1	29.1	26	18.7%	-0.55 [-1.11 , 0.00]
Schuppert 2012 (3)	13.29	9.53	48	15.39	9	49	36.1%	-0.22 [-0.62 , 0.17]
Subtotal (95% CI)			**139**			**134**	**100.0%**	**-0.39 [-0.63 , -0.15]**
Heterogeneity: Tau² = 0.00; Chi² = 1.11, df = 2 (P = 0.58); I² = 0%								
Test for overall effect: Z = 3.18 (P = 0.001)								
8.1.2 6-12 months follow-up								
Blum 2008 (4)	33	18.5432	65	32.4	26.1159	59	100.0%	0.03 [-0.33 , 0.38]
Subtotal (95% CI)			**65**			**59**	**100.0%**	**0.03 [-0.33 , 0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.15 (P = 0.88)								



Footnotes
(1) Zan-BPD - total (CR)
(2) Self reported: BPD-40
(3) BPDSI-IV total
(4) BEST - total (CR)

Analysis 8.2. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 2: Primary: self-harm (dichtomous), at end of treatment

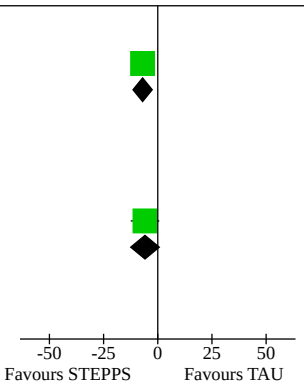
Study or Subgroup	STEPPS Events	STEPPS Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Bos 2010 (1)	16	28	13	30	1.32 [0.78 , 2.22]
Test for subgroup differences: Not applicable					



Footnotes
(1) participants scoring above BPDSI-IV-parasuicide cut-off score

Analysis 8.3. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 3: Primary: psychosocial functioning (continuous)

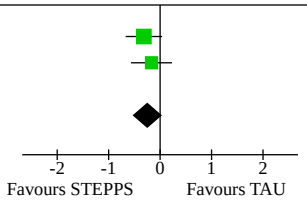
Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
8.3.1 End of treatment								
Blum 2008 (1)	-50.5	12.8996	65	-43.5	12.2898	59	100.0%	-7.00 [-11.43 , -2.57]
Subtotal (95% CI)			**65**			**59**	**100.0%**	**-7.00 [-11.43 , -2.57]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.09 (P = 0.002)								
8.3.2 6-12 months follow-up								
Blum 2008 (1)	-53	16.1245	65	-47.1	20.7391	59	100.0%	-5.90 [-12.49 , 0.69]
Subtotal (95% CI)			**65**			**59**	**100.0%**	**-5.90 [-12.49 , 0.69]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.76 (P = 0.08)								



Footnotes
(1) GAS (CR)

Analysis 8.4. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 4: Secondary: affective instability (continuous), at end of treatment

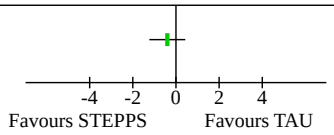
Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Blum 2008 (1)	3.9	3.2249	65	4.9	3.0725	59	55.8%	-0.32 [-0.67 , 0.04]
Schuppert 2012 (2)	3.88	2.37	48	4.29	2.48	49	44.2%	-0.17 [-0.57 , 0.23]
Total (95% CI)			**113**			**108**	**100.0%**	**-0.25 [-0.52 , 0.02]**
Heterogeneity: Tau² = 0.00; Chi² = 0.29, df = 1 (P = 0.59); I² = 0%								
Test for overall effect: Z = 1.85 (P = 0.06)								
Test for subgroup differences: Not applicable								



Footnotes
(1) ZAN-BPD - affective instability (CR)
(2) BPDS-IV - affective instability

Analysis 8.5. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 5: Secondary: impulsivity (continuous), at end of treatment

Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Blum 2008 (1)	1.9	2.4187	65	2.3	2.3043	59	-0.40 [-1.23 , 0.43]
Test for subgroup differences: Not applicable							

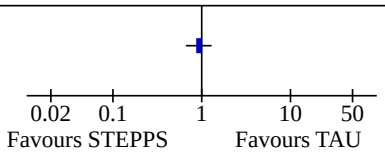


Footnotes
(1) Zan-BPD - impulsivity subscale

Analysis 8.6. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 6: Secondary: impulsivity (dichotomous), at end of treatment

Study or Subgroup	STEPPS Events	STEPPS Total	TAU Events	TAU Total	Risk Ratio IV, Fixed, 95% CI
Bos 2010 (1)	19	28	22	30	0.93 [0.66 , 1.29]

Test for subgroup differences: Not applicable



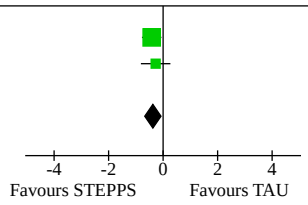
Footnotes

(1) participants scoring above BPDSI-IV-impulsivity cut-off score

Analysis 8.7. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 7: Secondary: interpersonal problems (continuous), at end of treatment

Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Weight	Std. Mean Difference IV, Random, 95% CI
Blum 2008 (1)	2.2	2.4187	65	3.2	2.3043	59	69.8%	-0.42 [-0.78 , -0.06]
Bos 2010 (2)	-13	3.5	27	-12	3.7	26	30.2%	-0.27 [-0.81 , 0.27]
Total (95% CI)			**92**			**85**	**100.0%**	**-0.38 [-0.67 , -0.08]**

Heterogeneity: Tau² = 0.00; Chi² = 0.20, df = 1 (P = 0.66); I² = 0%
Test for overall effect: Z = 2.48 (P = 0.01)
Test for subgroup differences: Not applicable



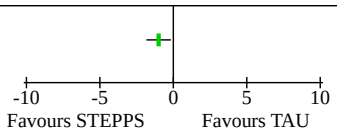
Footnotes

(1) ZAN-BPD - disturbed relationships (CR)
(2) Self reported: WHOQOL-Bref, social relationships

Analysis 8.8. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 8: Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment

Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Blum 2008 (1)	2	2.4187	65	3	2.3043	59	-1.00 [-1.83 , -0.17]

Test for subgroup differences: Not applicable

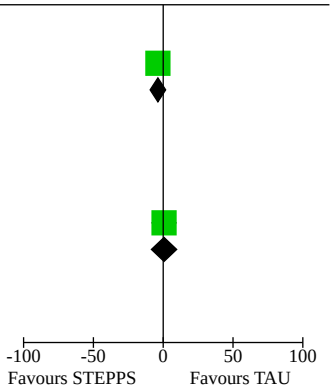


Footnotes

(1) Clinical rated: ZAN-BPD, cognitive subscale

Analysis 8.9. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 9: Secondary: depression (continuous), at end of treatment

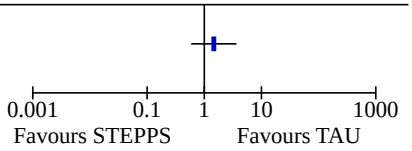
Study or Subgroup	STEPPS Mean	STEPPS SD	STEPPS Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
8.9.1 End of treatment								
Blum 2008 (1)	22	16.1245	65	25.8	15.3623	59	100.0%	-3.80 [-9.34 , 1.74]
Subtotal (95% CI)			**65**			**59**	**100.0%**	**-3.80 [-9.34 , 1.74]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.34 (P = 0.18)								
8.9.2 6-12 months follow-up								
Blum 2008 (1)	24	20.9619	65	23.4	29.1884	59	100.0%	0.60 [-8.42 , 9.62]
Subtotal (95% CI)			**65**			**59**	**100.0%**	**0.60 [-8.42 , 9.62]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.13 (P = 0.90)								



Footnotes
(1) Self reported: BDI

Analysis 8.10. Comparison 8: Systems training for emotional predictability and problem solving (STEPPS) vs TAU, Outcome 10: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	STEPPS Events	STEPPS Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Bos 2010	10	42	6	37	1.47 [0.59 , 3.65]



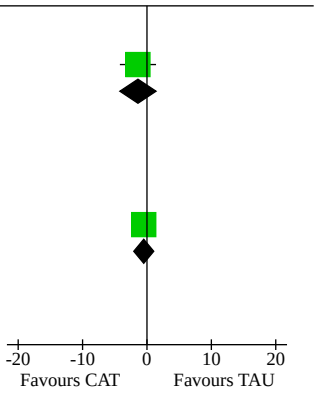
Comparison 9. Cognitive analytic therapy (CAT) vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
9.1 Primary: suicide-related outcomes (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
9.1.1 End of treatment	1	9	Mean Difference (IV, Fixed, 95% CI)	-1.40 [-4.21, 1.41]
9.1.2 0-6 months follow-up	1	8	Mean Difference (IV, Fixed, 95% CI)	-0.50 [-2.05, 1.05]
9.2 Primary: psychosocial functioning (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
9.2.1 End of treatment	1	9	Mean Difference (IV, Fixed, 95% CI)	-16.40 [-31.20, -1.60]
9.2.2 0-6 months follow-up	1	9	Mean Difference (IV, Fixed, 95% CI)	-15.80 [-29.36, -2.24]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
9.3 Secondary: anger (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
9.3.1 End of treatment	1	9	Mean Difference (IV, Fixed, 95% CI)	-1.90 [-7.97, 4.17]
9.3.2 0-6 months follow-up	1	8	Mean Difference (IV, Fixed, 95% CI)	-4.50 [-9.01, 0.01]
9.4 Secondary: dissociation and psychotic-like symptoms (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
9.4.1 End of treatment	1	9	Mean Difference (IV, Fixed, 95% CI)	-6.10 [-15.01, 2.81]
9.4.2 0-6 months follow-up	1	9	Mean Difference (IV, Fixed, 95% CI)	-11.70 [-24.02, 0.62]
9.5 Secondary: depression (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
9.5.1 End of treatment	1	9	Mean Difference (IV, Fixed, 95% CI)	-9.70 [-20.10, 0.70]
9.5.2 0-6 months follow-up	1	8	Mean Difference (IV, Fixed, 95% CI)	-3.70 [-11.99, 4.59]
9.6 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 9.1. Comparison 9: Cognitive analytic therapy (CAT) vs TAU, Outcome 1: Primary: suicide-related outcomes (continuous)

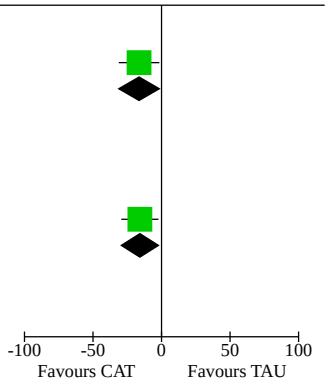
Study or Subgroup	CAT Mean	CAT SD	CAT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
9.1.1 End of treatment								
Gleeson 2012 (1)	0.8	1	4	2.2	3	5	100.0%	-1.40 [-4.21 , 1.41]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-1.40 [-4.21 , 1.41]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.98 (P = 0.33)								
9.1.2 0-6 months follow-up								
Gleeson 2012 (1)	0.3	0.5	4	0.8	1.5	4	100.0%	-0.50 [-2.05 , 1.05]
Subtotal (95% CI)			**4**			**4**	**100.0%**	**-0.50 [-2.05 , 1.05]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.63 (P = 0.53)								



Footnotes
(1) OAS-M - suicidality (CR)

Analysis 9.2. Comparison 9: Cognitive analytic therapy (CAT) vs TAU, Outcome 2: Primary: psychosocial functioning (continuous)

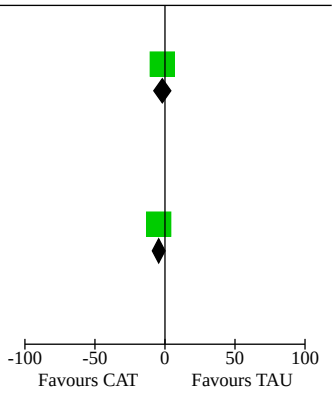
Study or Subgroup	CAT Mean	CAT SD	CAT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
9.2.1 End of treatment								
Gleeson 2012 (1)	-67	8.3	4	-50.6	14.1	5	100.0%	-16.40 [-31.20 , -1.60]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-16.40 [-31.20 , -1.60]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.17 (P = 0.03)								
9.2.2 0-6 months follow-up								
Gleeson 2012 (1)	-69.3	4.3	4	-53.5	14.7	5	100.0%	-15.80 [-29.36 , -2.24]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-15.80 [-29.36 , -2.24]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.28 (P = 0.02)								



Footnotes
(1) SOFAS (CR)

Analysis 9.3. Comparison 9: Cognitive analytic therapy (CAT) vs TAU, Outcome 3: Secondary: anger (continuous)

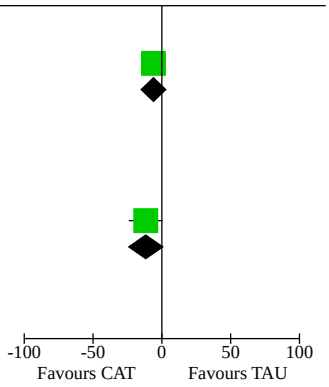
Study or Subgroup	CAT Mean	CAT SD	CAT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
9.3.1 End of treatment								
Gleeson 2012 (1)	13.3	5.4	4	15.2	3.4	5	100.0%	-1.90 [-7.97 , 4.17]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-1.90 [-7.97 , 4.17]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.61 (P = 0.54)								
9.3.2 0-6 months follow-up								
Gleeson 2012 (1)	10	2.6	4	14.5	3.8	4	100.0%	-4.50 [-9.01 , 0.01]
Subtotal (95% CI)			**4**			**4**	**100.0%**	**-4.50 [-9.01 , 0.01]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.95 (P = 0.05)								



Footnotes
(1) AIAQ - labile anger (SR)

Analysis 9.4. Comparison 9: Cognitive analytic therapy (CAT) vs TAU, Outcome 4: Secondary: dissociation and psychotic-like symptoms (continuous)

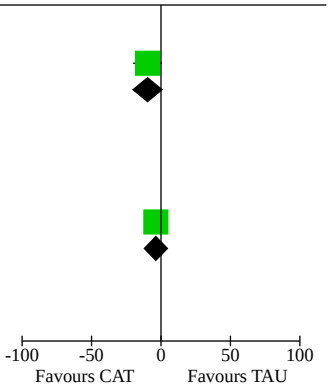
Study or Subgroup	CAT Mean	CAT SD	CAT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
9.4.1 End of treatment								
Gleeson 2012 (1)	43.5	6.5	4	49.6	7.1	5	100.0%	-6.10 [-15.01 , 2.81]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-6.10 [-15.01 , 2.81]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.34 (P = 0.18)								
9.4.2 0-6 months follow-up								
Gleeson 2012 (1)	33.8	6.4	4	45.5	12.1	5	100.0%	-11.70 [-24.02 , 0.62]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-11.70 [-24.02 , 0.62]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.86 (P = 0.06)								



Footnotes
(1) BPRS (CR)

Analysis 9.5. Comparison 9: Cognitive analytic therapy (CAT) vs TAU, Outcome 5: Secondary: depression (continuous)

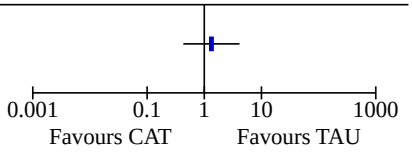
Study or Subgroup	CAT Mean	CAT SD	CAT Total	TAU Mean	TAU SD	TAU Total	Weight	Mean Difference IV, Fixed, 95% CI
9.5.1 End of treatment								
Gleeson 2012 (1)	12.3	8	4	22	7.8	5	100.0%	-9.70 [-20.10 , 0.70]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-9.70 [-20.10 , 0.70]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.83 (P = 0.07)								
9.5.2 0-6 months follow-up								
Gleeson 2012 (1)	10.8	4.6	4	14.5	7.1	4	100.0%	-3.70 [-11.99 , 4.59]
Subtotal (95% CI)			**4**			**4**	**100.0%**	**-3.70 [-11.99 , 4.59]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.87 (P = 0.38)								



Footnotes
(1) MADRS (CR)

Analysis 9.6. Comparison 9: Cognitive analytic therapy (CAT) vs TAU, Outcome 6: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	CAT Events	CAT Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Gleeson 2012	4	8	3	8	1.33 [0.43 , 4.13]
Test for subgroup differences: Not applicable					



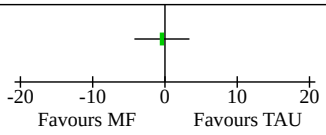
Comparison 10. Motivation feedback (MF) vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
10.1 Primary: psychosocial functioning, at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Analysis 10.1. Comparison 10: Motivation feedback (MF) vs TAU, Outcome 1: Primary: psychosocial functioning, at end of treatment

Study or Subgroup	MF Mean	MF SD	MF Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Jochems 2015 (1)	12.8	6.36	16	13.22	5.8	27	-0.42 [-4.23 , 3.39]

Test for subgroup differences: Not applicable



Footnotes

(1) Clinician-rated: HoNOS

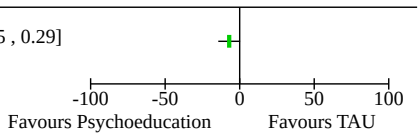
Comparison 11. Psychoeducation vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
11.1 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
11.2 Secondary: attrition (dichotomous), at end of treatment	1		Odds Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 11.1. Comparison 11: Psychoeducation vs TAU, Outcome 1: Secondary: depression (continuous), at end of treatment

Study or Subgroup	Psychoeducation Mean	Psychoeducation SD	Psychoeducation Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Zanarini 2018 (1)	24.18	16.15	39	31.21	16.62	38	-7.03 [-14.35 , 0.29]

Test for subgroup differences: Not applicable



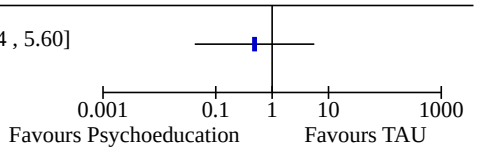
Footnotes

(1) Self rated: The Clinically Useful Depression Outcome Scale, total score

Analysis 11.2. Comparison 11: Psychoeducation vs TAU, Outcome 2: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	Psychoeducation Events	Psychoeducation Total	TAU Events	TAU Total	Odds Ratio M-H, Fixed, 95% CI
Zanarini 2018	1	40	2	40	0.49 [0.04 , 5.60]

Test for subgroup differences: Not applicable



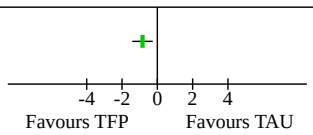
Comparison 12. Transference-focused psychotherapy (TFP) vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
12.1 Primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
12.2 Primary: self-harm (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
12.3 Primary: suicide-related outcomes (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
12.4 Primary: psychosocial functioning (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
12.5 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
12.6 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 12.1. Comparison 12: Transference-focused psychotherapy (TFP) vs TAU, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	TFP Mean	TFP SD	TFP Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Doering 2010 (1)	4.79	1.54	52	5.63	1.47	52	-0.84 [-1.42 , -0.26]

Test for subgroup differences: Not applicable

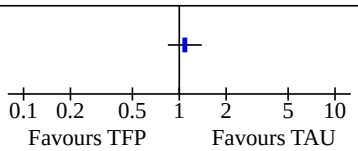


Footnotes

(1) Clinician-rated: Mean number of DSM-IV BPD criteria met

Analysis 12.2. Comparison 12: Transference-focused psychotherapy (TFP) vs TAU, Outcome 2: Primary: self-harm (dichotomous), at end of treatment

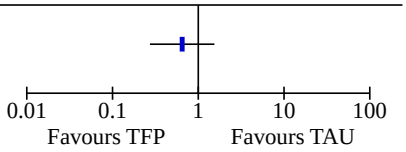
Study or Subgroup	TFP Events	TFP Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Doering 2010 (1)	38	52	35	52	1.09 [0.84 , 1.40]
Test for subgroup differences: Not applicable					



Footnotes
(1) CISSB - participants with self-harming behaviour (last 12 months) (SR)

Analysis 12.3. Comparison 12: Transference-focused psychotherapy (TFP) vs TAU, Outcome 3: Primary: suicide-related outcomes (dichotomous), at end of treatment

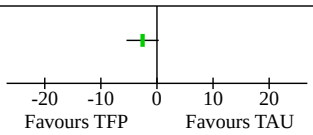
Study or Subgroup	TFP Events	TFP Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Doering 2010 (1)	7	51	11	52	0.65 [0.27 , 1.54]
Test for subgroup differences: Not applicable					



Footnotes
(1) CISSB - participants with suicide attempts (last 12 months) (SR)

Analysis 12.4. Comparison 12: Transference-focused psychotherapy (TFP) vs TAU, Outcome 4: Primary: psychosocial functioning (continuous), at end of treatment

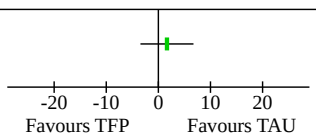
Study or Subgroup	TFP Mean	TFP SD	TFP Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Doering 2010 (1)	-58.62	8.04	52	-56.06	6.87	52	-2.56 [-5.43 , 0.31]
Test for subgroup differences: Not applicable							



Footnotes
(1) Clinician-rated: GAF

Analysis 12.5. Comparison 12: Transference-focused psychotherapy (TFP) vs TAU, Outcome 5: Secondary: depression (continuous), at end of treatment

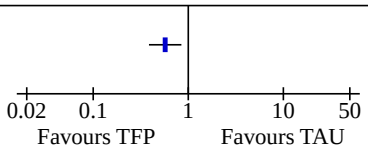
Study or Subgroup	TFP Mean	TFP SD	TFP Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Doering 2010 (1)	21.67	13.25	52	20.02	13.22	52	1.65 [-3.44 , 6.74]
Test for subgroup differences: Not applicable							



Footnotes
(1) Self-rated: BDI

Analysis 12.6. Comparison 12: Transference-focused psychotherapy (TFP) vs TAU, Outcome 6: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	TFP Events	TFP Total	TAU Events	TAU Total	Risk Ratio M-H, Fixed, 95% CI
Doering 2010	20	52	35	52	0.57 [0.39 , 0.85]
Test for subgroup differences: Not applicable					

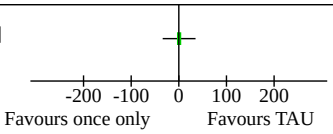


Comparison 13. Once-only interventions (individual setting) vs TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
13.1 Primary: self-harm (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
13.2 Primary: psychosocial functioning (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
13.3 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
13.4 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 13.1. Comparison 13: Once-only interventions (individual setting) vs TAU, Outcome 1: Primary: self-harm (continuous), at end of treatment

Study or Subgroup	Once only Mean	Once only SD	Once only Total	TAU Mean	TAU SD	TAU Total	Mean Difference IV, Fixed, 95% CI
Borschmann 2013 (1)	20.6	89.71	36	20	55.6	36	0.60 [-33.88 , 35.08]
Test for subgroup differences: Not applicable							



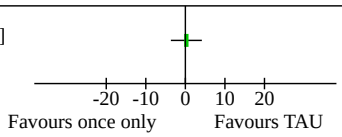
Footnotes

(1) SHQ - number of suicidal and self-injurious episodes (past 6 months) (SR)

Analysis 13.2. Comparison 13: Once-only interventions (individual setting) vs TAU, Outcome 2: Primary: psychosocial functioning (continuous), at end of treatment

Study or Subgroup	Once only Mean	SD	Total	TAU Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Borschmann 2013 (1)	26.06	7.98	36	25.81	8.94	36	0.25 [-3.66 , 4.16]

Test for subgroup differences: Not applicable

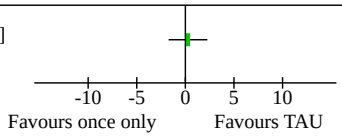


Footnotes
(1) WSAS (SR)

Analysis 13.3. Comparison 13: Once-only interventions (individual setting) vs TAU, Outcome 3: Secondary: depression (continuous), at end of treatment

Study or Subgroup	Once only Mean	SD	Total	TAU Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Borschmann 2013 (1)	10.47	3.54	36	10.2	4.96	36	0.27 [-1.72 , 2.26]

Test for subgroup differences: Not applicable

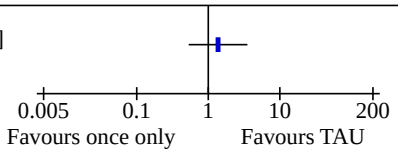


Footnotes
(1) Self rated: HADS, depression

Analysis 13.4. Comparison 13: Once-only interventions (individual setting) vs TAU, Outcome 4: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	Once only Events	Total	TAU Events	Total	Risk Ratio M-H, Fixed, 95% CI
Borschmann 2013	9	46	6	42	1.37 [0.53 , 3.52]

Test for subgroup differences: Not applicable



Comparison 14. Eclectic treatments vs TAU

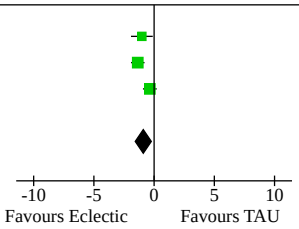
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
14.1 Primary: BPD symptom severity (continuous), at end of treatment	3	134	Std. Mean Difference (IV, Random, 95% CI)	-0.90 [-1.57, -0.23]
14.2 Primary: self-harm (continuous), at end of treatment	2	83	Std. Mean Difference (IV, Random, 95% CI)	-0.84 [-1.29, -0.39]
14.3 Primary: suicide-related outcomes (continuous), at end of treatment	2	221	Std. Mean Difference (IV, Random, 95% CI)	-0.55 [-1.29, 0.19]
14.4 Primary: psychosocial functioning (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
14.4.1 End of treatment	2	231	Std. Mean Difference (IV, Random, 95% CI)	-0.57 [-1.10, -0.04]
14.4.2 Above 12 months follow-up	1	170	Std. Mean Difference (IV, Random, 95% CI)	-0.64 [-1.04, -0.24]
14.5 Secondary: anger (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
14.6 Secondary: affective instability (continuous), at end of treatment	3	134	Std. Mean Difference (IV, Random, 95% CI)	-0.95 [-1.74, -0.15]
14.7 Secondary: chronic feelings of emptiness (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
14.8 Secondary: impulsivity (continuous), at end of treatment	3	134	Std. Mean Difference (IV, Random, 95% CI)	-0.76 [-1.30, -0.22]
14.9 Secondary: interpersonal problems (continuous), at end of treatment	2	112	Std. Mean Difference (IV, Random, 95% CI)	-0.62 [-1.09, -0.15]
14.10 Secondary: abandonment (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
14.11 Secondary: identity disturbance (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
14.12 Secondary: depression (continuous), at end of treatment	4	304	Std. Mean Difference (IV, Random, 95% CI)	-0.82 [-1.38, -0.26]
14.13 Secondary: attrition (dichotomuous), at end of treatment	4	326	Risk Ratio (M-H, Random, 95% CI)	1.06 [0.85, 1.32]
14.14 Secondary: adverse effects (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 14.1. Comparison 14: Eclectic treatments vs TAU, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Gratz 2006 (1)	25.83	5.72	12	34.7	10.81	10	26.2%	-1.02 [-1.92 , -0.11]
Gratz 2014 (1)	27.47	6.59	31	35.88	5.59	30	37.1%	-1.36 [-1.92 , -0.80]
Leppänen 2016 (2)	17.54	10.14	19	21.48	11.41	32	36.7%	-0.35 [-0.93 , 0.22]
Total (95% CI)			**62**			**72**	**100.0%**	**-0.90 [-1.57 , -0.23]**

Heterogeneity: Tau² = 0.23; Chi² = 6.11, df = 2 (P = 0.05); I² = 67%
Test for overall effect: Z = 2.64 (P = 0.008)
Test for subgroup differences: Not applicable

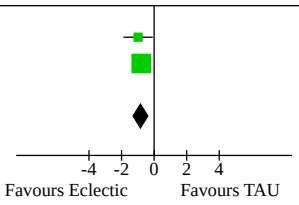


Footnotes
(1) BEST (SR)
(2) Clinician-rated: BPDSI-IV

Analysis 14.2. Comparison 14: Eclectic treatments vs TAU, Outcome 2: Primary: self-harm (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Gratz 2006 (1)	2.05	0.93	12	4.48	3.39	10	25.3%	-0.98 [-1.88 , -0.09]
Gratz 2014 (1)	0.69	0.35	31	0.97	0.35	30	74.7%	-0.79 [-1.31 , -0.27]
Total (95% CI)			**43**			**40**	**100.0%**	**-0.84 [-1.29 , -0.39]**

Heterogeneity: Tau² = 0.00; Chi² = 0.13, df = 1 (P = 0.71); I² = 0%
Test for overall effect: Z = 3.64 (P = 0.0003)
Test for subgroup differences: Not applicable

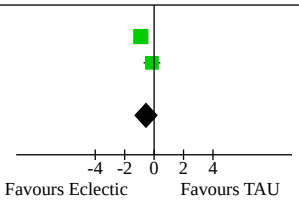


Footnotes
(1) DSHI (SR)

Analysis 14.3. Comparison 14: Eclectic treatments vs TAU, Outcome 3: Primary: suicide-related outcomes (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Andreoli 2016 (1)	0.35	0.6082	140	1	1.1	30	53.6%	-0.90 [-1.31 , -0.50]
Leppänen 2016 (2)	0.41	0.49	19	0.51	0.76	32	46.4%	-0.15 [-0.71 , 0.42]
Total (95% CI)			**159**			**62**	**100.0%**	**-0.55 [-1.29 , 0.19]**

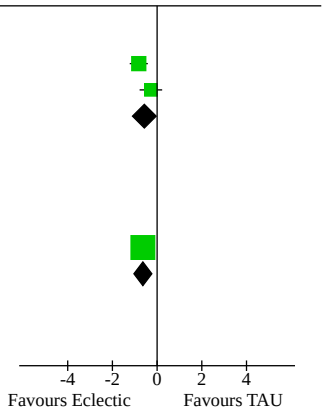
Heterogeneity: Tau² = 0.22; Chi² = 4.49, df = 1 (P = 0.03); I² = 78%
Test for overall effect: Z = 1.46 (P = 0.14)
Test for subgroup differences: Not applicable



Footnotes
(1) Episode of suicidal ideation, with or without deliberate self-harm
(2) BPDSI-IV - Parasuicidality, suicide plans and attempts (CR)

Analysis 14.4. Comparison 14: Eclectic treatments vs TAU, Outcome 4: Primary: psychosocial functioning (continuous)

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
14.4.1 End of treatment								
Andreoli 2016 (1)	-62.95	6.2343	140	-57.6	7.6	30	54.0%	-0.82 [-1.22 , -0.42]
Gratz 2014 (2)	14.25	6.24	31	16.01	6.24	30	46.0%	-0.28 [-0.78 , 0.23]
Subtotal (95% CI)			**171**			**60**	**100.0%**	**-0.57 [-1.10 , -0.04]**
Heterogeneity: Tau² = 0.09; Chi² = 2.70, df = 1 (P = 0.10); I² = 63%								
Test for overall effect: Z = 2.12 (P = 0.03)								
14.4.2 Above 12 months follow-up								
Andreoli 2016 (1)	-65.6	11.6	140	-58.1	12.3	30	100.0%	-0.64 [-1.04 , -0.24]
Subtotal (95% CI)			**140**			**30**	**100.0%**	**-0.64 [-1.04 , -0.24]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.12 (P = 0.002)								

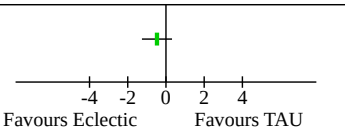


Footnotes
(1) Clinician rated: GAS
(2) Self rated: SDS

Analysis 14.5. Comparison 14: Eclectic treatments vs TAU, Outcome 5: Secondary: anger (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Leppänen 2016 (1)	0.8	1.3	19	1.27	1.52	32	-0.47 [-1.26 , 0.32]

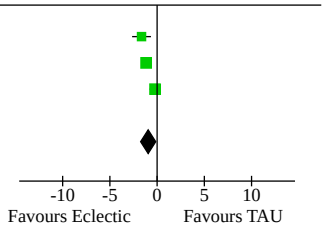
Test for subgroup differences: Not applicable



Footnotes
(1) Clinician-rated: BPDSI-IV, anger

Analysis 14.6. Comparison 14: Eclectic treatments vs TAU, Outcome 6: Secondary: affective instability (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Gratz 2006 (1)	79.75	23.97	12	115.8	16.74	10	26.4%	-1.65 [-2.65 , -0.65]
Gratz 2014 (1)	95.27	15.6	31	113.62	15.6	30	37.1%	-1.16 [-1.71 , -0.62]
Leppänen 2016 (2)	5.65	2.83	19	6.26	2.65	32	36.5%	-0.22 [-0.79 , 0.35]
Total (95% CI)			**62**			**72**	**100.0%**	**-0.95 [-1.74 , -0.15]**
Heterogeneity: Tau² = 0.37; Chi² = 8.41, df = 2 (P = 0.01); I² = 76%								
Test for overall effect: Z = 2.33 (P = 0.02)								
Test for subgroup differences: Not applicable								

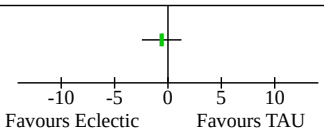


Footnotes
(1) DERS - total (SR)
(2) Clinician-rated: BPDSI-IV, affective instability

Analysis 14.7. Comparison 14: Eclectic treatments vs TAU, Outcome 7: Secondary: chronic feelings of emptiness (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Leppänen 2016 (1)	3.55	3.24	19	4.14	3.31	32	-0.59 [-2.44 , 1.26]

Test for subgroup differences: Not applicable

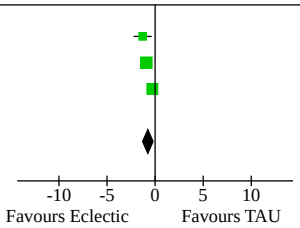


Footnotes
(1) Clinician-rated: BPDSI-IV, emptiness

Analysis 14.8. Comparison 14: Eclectic treatments vs TAU, Outcome 8: Secondary: impulsivity (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Gratz 2006 (1)	10.92	3.85	12	17.1	5.34	10	22.0%	-1.30 [-2.24 , -0.36]
Gratz 2014 (1)	15.23	3.83	31	18.74	3.83	30	40.2%	-0.90 [-1.43 , -0.38]
Leppänen 2016 (2)	0.99	0.76	19	1.22	0.81	32	37.8%	-0.29 [-0.86 , 0.28]
Total (95% CI)			**62**			**72**	**100.0%**	**-0.76 [-1.30 , -0.22]**

Heterogeneity: Tau² = 0.12; Chi² = 4.14, df = 2 (P = 0.13); I² = 52%
Test for overall effect: Z = 2.74 (P = 0.006)
Test for subgroup differences: Not applicable

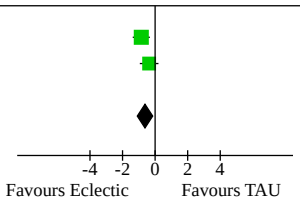


Footnotes
(1) DERS-impulse (SR)
(2) Clinician-rated: BPDSI-IV, impulsivity

Analysis 14.9. Comparison 14: Eclectic treatments vs TAU, Outcome 9: Secondary: interpersonal problems (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Gratz 2014 (1)	1.45	0.57	31	1.94	0.57	30	52.9%	-0.85 [-1.37 , -0.32]
Leppänen 2016 (2)	1.01	0.72	19	1.34	0.97	32	47.1%	-0.37 [-0.94 , 0.21]
Total (95% CI)			**50**			**62**	**100.0%**	**-0.62 [-1.09 , -0.15]**

Heterogeneity: Tau² = 0.04; Chi² = 1.48, df = 1 (P = 0.22); I² = 32%
Test for overall effect: Z = 2.58 (P = 0.010)
Test for subgroup differences: Not applicable

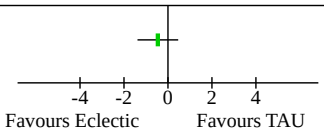


Footnotes
(1) IIP-BPD (SR)
(2) Clinician-rated: BPDSI-IV, unstable relationships

Analysis 14.10. Comparison 14: Eclectic treatments vs TAU, Outcome 10: Secondary: abandonment (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Leppänen 2016 (1)	1.42	1.39	19	1.88	1.97	32	-0.46 [-1.39 , 0.47]

Test for subgroup differences: Not applicable



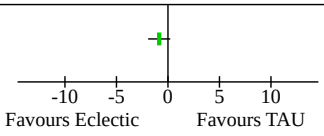
Footnotes

(1) Clinician-rated: BPDSI-IV, abandonment

Analysis 14.11. Comparison 14: Eclectic treatments vs TAU, Outcome 11: Secondary: identity disturbance (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Leppänen 2016 (1)	2.17	1.78	19	3.02	2.06	32	-0.85 [-1.92 , 0.22]

Test for subgroup differences: Not applicable



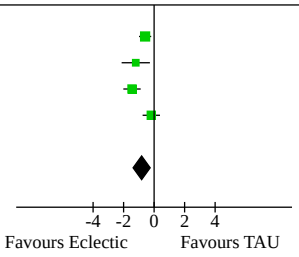
Footnotes

(1) Clinician-rated: BPDSI-IV, identity disturbance

Analysis 14.12. Comparison 14: Eclectic treatments vs TAU, Outcome 12: Secondary: depression (continuous), at end of treatment

Study or Subgroup	Eclectic treatments Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Andreoli 2016 (1)	9.95	5.6912	140	13.4	6.4	30	30.1%	-0.59 [-0.99 , -0.19]
Gratz 2006 (2)	9	6.52	12	23.2	15.32	10	18.0%	-1.20 [-2.13 , -0.28]
Gratz 2014 (2)	13.04	5.63	31	21.3	5.63	30	26.0%	-1.45 [-2.02 , -0.88]
Leppänen 2016 (3)	1.55	1.7	19	1.84	1.45	32	26.0%	-0.18 [-0.75 , 0.38]
Total (95% CI)			**202**			**102**	**100.0%**	**-0.82 [-1.38 , -0.26]**

Heterogeneity: Tau² = 0.23; Chi² = 11.13, df = 3 (P = 0.01); I² = 73%
Test for overall effect: Z = 2.87 (P = 0.004)
Test for subgroup differences: Not applicable



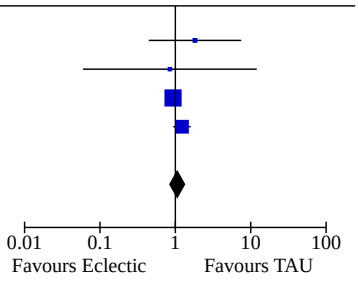
Footnotes

(1) Clinician rated: HDRS-17
(2) DASS-Depression (SR)
(3) Clinician-rated: BPDSI-IV, paranoid ideation

Analysis 14.13. Comparison 14: Eclectic treatments vs TAU, Outcome 13: Secondary: attrition (dichotomuous), at end of treatment

Study or Subgroup	Eclectic treatments Events	Total	TAU Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Andreoli 2016	17	140	2	30	2.4%	1.82 [0.44 , 7.47]
Gratz 2006	1	13	1	11	0.7%	0.85 [0.06 , 12.01]
Gratz 2014	26	31	27	30	55.9%	0.93 [0.77 , 1.13]
Leppänen 2016	20	24	32	47	41.0%	1.22 [0.94 , 1.60]
Total (95% CI)		**208**		**118**	**100.0%**	**1.06 [0.85 , 1.32]**
Total events:	64		62			

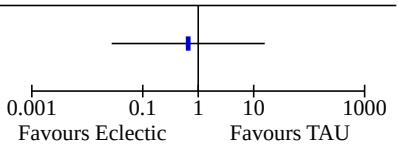
Heterogeneity: Tau² = 0.01; Chi² = 3.99, df = 3 (P = 0.26); I² = 25%
Test for overall effect: Z = 0.50 (P = 0.62)
Test for subgroup differences: Not applicable



Analysis 14.14. Comparison 14: Eclectic treatments vs TAU, Outcome 14: Secondary: adverse effects (dichotomous), at end of treatment

Study or Subgroup	Eclectic treatments Events	Total	TAU Events	Total	Risk Ratio M-H, Fixed, 95% CI
Andreoli 2016	1	140	0	30	0.66 [0.03 , 15.81]

Test for subgroup differences: Not applicable



Comparison 15. Psychotherapy vs waiting list or no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
15.1 Primary: BPD symptom severity (continuous), at end of treatment	3	161	Std. Mean Difference (IV, Random, 95% CI)	-0.49 [-0.93, -0.05]
15.2 Primary: self-harm (continuous), at end of treatment	2	128	Std. Mean Difference (IV, Random, 95% CI)	-0.17 [-0.52, 0.18]
15.3 Primary: suicide-related outcomes (continuous), at end of treatment	2	108	Std. Mean Difference (IV, Random, 95% CI)	-5.62 [-16.39, 5.16]
15.4 Primary: psychosocial functioning (continuous)	5		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
15.4.1 End of treatment	5	219	Std. Mean Difference (IV, Random, 95% CI)	-0.56 [-1.01, -0.11]
15.4.2 0-6 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.89 [-1.65, -0.13]
15.4.3 6-12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-1.04 [-1.81, -0.27]

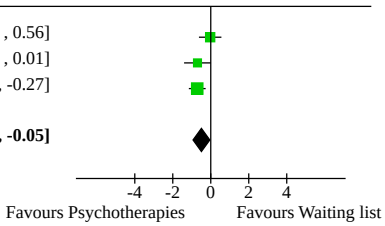
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
15.4.4 Above 12 months follow-up	1	28	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-1.14, 0.37]
15.5 Secondary: anger (continuous), at end of treatment	2	128	Std. Mean Difference (IV, Random, 95% CI)	-0.58 [-1.70, 0.55]
15.6 Secondary: affective instability (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
15.6.1 End of treatment	2	128	Std. Mean Difference (IV, Random, 95% CI)	-0.99 [-1.36, -0.62]
15.6.2 0-6 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-1.20, 0.26]
15.6.3 6-12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-1.10, 0.34]
15.6.4 Above 12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.28 [-1.01, 0.44]
15.7 Secondary: chronic feelings of emptiness (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
15.8 Secondary: impulsivity (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
15.8.1 End of treatment	3	178	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-0.82, -0.22]
15.8.2 0-6 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.90 [-1.66, -0.14]
15.8.3 6-12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.79 [-1.54, -0.04]
15.8.4 Above 12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.75 [-1.50, -0.01]
15.9 Secondary: interpersonal problems (continuous)	3		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
15.9.1 End of treatment	3	120	Std. Mean Difference (IV, Random, 95% CI)	-0.85 [-1.23, -0.47]
15.9.2 0-6 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-1.40 [-2.21, -0.59]
15.9.3 6-12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.90 [-1.66, -0.14]
15.9.4 Above 12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.86 [-1.62, -0.11]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
15.10 Secondary: abandonment (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
15.11 Secondary: identity disturbance (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
15.12 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	2	77	Std. Mean Difference (IV, Random, 95% CI)	-0.13 [-0.65, 0.39]
15.13 Secondary: depression (continuous), at end of treatment	6	239	Std. Mean Difference (IV, Random, 95% CI)	-1.28 [-2.21, -0.34]
15.14 Secondary: attrition (dichotomous), at end of treatment	3	144	Risk Ratio (M-H, Random, 95% CI)	0.55 [0.20, 1.50]

Analysis 15.1. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bellino 2010 (1)	33.27	5.96	22	33.46	5.95	22	31.8%	-0.03 [-0.62 , 0.56]
Bohus 2013 (2)	3.24	2.14	17	4.62	1.67	16	25.6%	-0.70 [-1.40 , 0.01]
McMain 2017 (3)	33.72	18.7	42	48.48	22.21	42	42.6%	-0.71 [-1.15 , -0.27]
Total (95% CI)			**81**			**80**	**100.0%**	**-0.49 [-0.93 , -0.05]**

Heterogeneity: Tau² = 0.07; Chi² = 3.60, df = 2 (P = 0.17); I² = 44%
Test for overall effect: Z = 2.19 (P = 0.03)
Test for subgroup differences: Not applicable

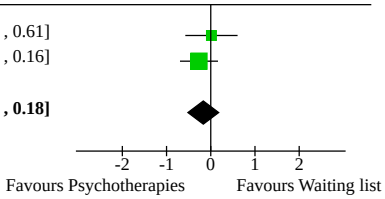


Footnotes
(1) Clinician-rated: BPDSI-IV
(2) IPDE-BPD criteria (CR)
(3) Self rated: BSL

Analysis 15.2. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 2: Primary: self-harm (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bellino 2010 (1)	2.02	1.92	22	1.99	1.87	22	34.6%	0.02 [-0.58 , 0.61]
McMain 2017 (2)	1.14	3.26	42	2.59	6.9	42	65.4%	-0.27 [-0.70 , 0.16]
Total (95% CI)			**64**			**64**	**100.0%**	**-0.17 [-0.52 , 0.18]**

Heterogeneity: Tau² = 0.00; Chi² = 0.57, df = 1 (P = 0.45); I² = 0%
Test for overall effect: Z = 0.95 (P = 0.34)
Test for subgroup differences: Not applicable

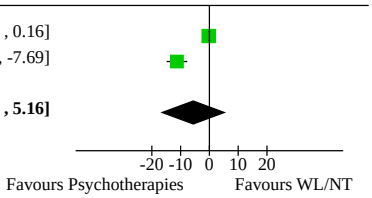


Footnotes
(1) Clinician rated: BPDSI-IV, parasuicidal behaviour
(2) Self rated: DSHI

Analysis 15.3. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 3: Primary: suicide-related outcomes (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list/no treatment Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
McMain 2017 (1)	1.14	3.26	42	2.59	6.9	42	51.4%	-0.27 [-0.70 , 0.16]
Mohamadizadeh 2017 (2)	15.25	1.65	12	31	0.96	12	48.6%	-11.27 [-14.84 , -7.69]
Total (95% CI)			**54**			**54**	**100.0%**	**-5.62 [-16.39 , 5.16]**

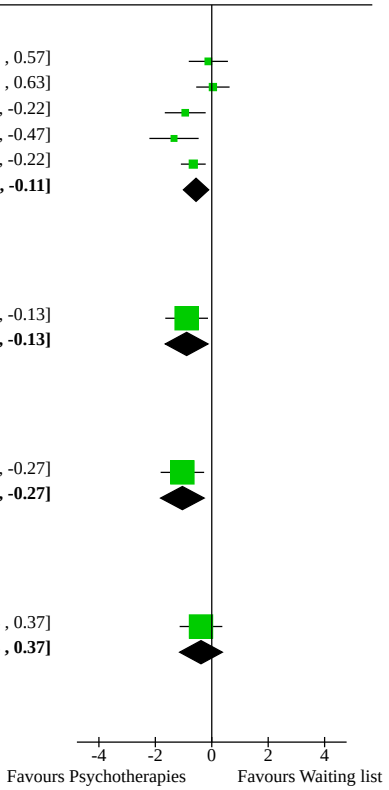
Heterogeneity: Tau² = 58.81; Chi² = 35.82, df = 1 (P < 0.00001); I² = 97%
Test for overall effect: Z = 1.02 (P = 0.31)
Test for subgroup differences: Not applicable



Footnotes
(1) Self rated: DSHI
(2) Self rated: BSS

Analysis 15.4. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 4: Primary: psychosocial functioning (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
15.4.1 End of treatment								
Bellino 2006 (1)	2.9	0.9	16	3	0.7	16	19.0%	-0.12 [-0.81 , 0.57]
Bellino 2010 (2)	4.37	0.49	22	4.35	0.48	22	21.7%	0.04 [-0.55 , 0.63]
Bohus 2013 (3)	-47.88	7.8	17	-40.88	6.64	16	18.2%	-0.94 [-1.66 , -0.22]
Haeyen 2018 (4)	46.27	9.77	15	64.91	17.42	11	15.0%	-1.34 [-2.21 , -0.47]
McMain 2017 (5)	2.5	0.56	42	2.88	0.59	42	26.1%	-0.65 [-1.09 , -0.22]
Subtotal (95% CI)			**112**			**107**	**100.0%**	**-0.56 [-1.01 , -0.11]**
Heterogeneity: Tau² = 0.15; Chi² = 9.75, df = 4 (P = 0.04); I² = 59%								
Test for overall effect: Z = 2.44 (P = 0.01)								
15.4.2 0-6 months follow-up								
Bellino 2010 (6)	-67.99	14.45	16	-55.6	12.4	14	100.0%	-0.89 [-1.65 , -0.13]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.89 [-1.65 , -0.13]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.31 (P = 0.02)								
15.4.3 6-12 months follow-up								
Bellino 2010 (6)	-70.12	13.2	16	-56.53	12.1	14	100.0%	-1.04 [-1.81 , -0.27]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.04 [-1.81 , -0.27]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.65 (P = 0.008)								
15.4.4 Above 12 months follow-up								
Bellino 2010 (6)	-70	13.1	16	-55.32	55.32	12	100.0%	-0.38 [-1.14 , 0.37]
Subtotal (95% CI)			**16**			**12**	**100.0%**	**-0.38 [-1.14 , 0.37]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.99 (P = 0.32)								

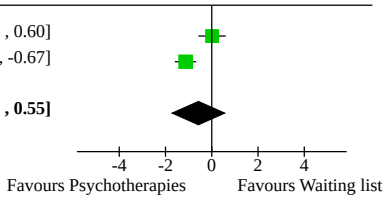


Footnotes
(1) Clinician rated: CGI-S
(2) Observer rated:CGI-S
(3) Clinician rated: GAF
(4) Self reported: OQ45, total score
(5) Self rated: SAS-SR
(6) SAT-P social functioning

Analysis 15.5. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 5: Secondary: anger (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bellino 2010 (1)	5.26	0.71	22	5.25	0.69	22	48.7%	0.01 [-0.58 , 0.60]
McMain 2017 (2)	29.73	9.27	42	41.18	10.68	42	51.3%	-1.13 [-1.60 , -0.67]
Total (95% CI)			**64**			**64**	**100.0%**	**-0.58 [-1.70 , 0.55]**

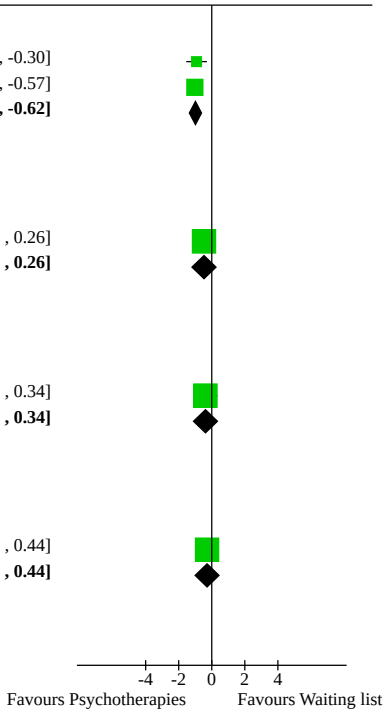
Heterogeneity: Tau² = 0.59; Chi² = 9.00, df = 1 (P = 0.003); I² = 89%
Test for overall effect: Z = 1.00 (P = 0.32)
Test for subgroup differences: Not applicable



Footnotes
(1) Observer rated: BPDSI-IV, anger
(2) Self rated: STAXI, trait anger

Analysis 15.6. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 6: Secondary: affective instability (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
15.6.1 End of treatment								
Bellino 2010 (1)	5.61	1.18	22	6.63	0.99	22	34.8%	-0.92 [-1.54 , -0.30]
McMain 2017 (2)	106.55	20.22	42	126.7	18.76	42	65.2%	-1.02 [-1.48 , -0.57]
Subtotal (95% CI)			**64**			**64**	**100.0%**	**-0.99 [-1.36 , -0.62]**
Heterogeneity: Tau² = 0.00; Chi² = 0.07, df = 1 (P = 0.79); I² = 0%								
Test for overall effect: Z = 5.25 (P < 0.00001)								
15.6.2 0-6 months follow-up								
Bellino 2010 (3)	5.96	0.9	16	6.42	1.01	14	100.0%	-0.47 [-1.20 , 0.26]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.47 [-1.20 , 0.26]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.26 (P = 0.21)								
15.6.3 6-12 months follow-up								
Bellino 2010 (3)	5.99	0.88	16	6.38	1.12	14	100.0%	-0.38 [-1.10 , 0.34]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.38 [-1.10 , 0.34]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.03 (P = 0.30)								
15.6.4 Above 12 months follow-up								
Bellino 2010 (3)	6.06	1.22	16	6.4	1.1	14	100.0%	-0.28 [-1.01 , 0.44]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.28 [-1.01 , 0.44]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.77 (P = 0.44)								

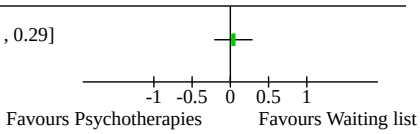


Footnotes
(1) Observer rated: BPDSI-IV, affective instability
(2) Self rated: DERS
(3) Observer rated: BPDSI-IV affective instability

Analysis 15.7. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 7: Secondary: chronic feelings of emptiness (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	7.16	0.42	22	7.12	0.43	22	0.04 [-0.21 , 0.29]	

Test for subgroup differences: Not applicable

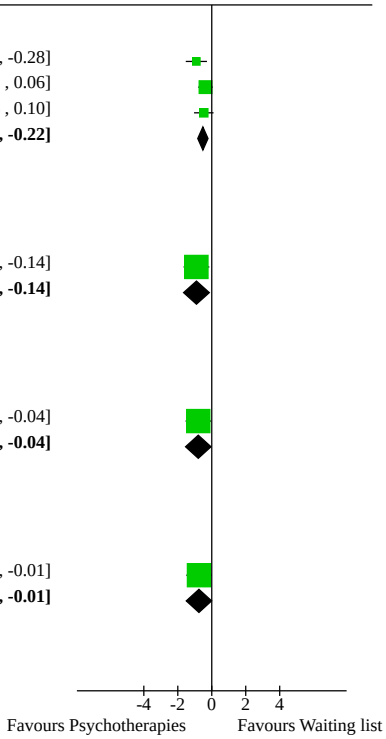


Footnotes

(1) Observer rated: BPDSI-IV, chronic feelings of emptiness

Analysis 15.8. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 8: Secondary: impulsivity (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI	Std. Mean Difference IV, Random, 95% CI
15.8.1 End of treatment									
Bellino 2010 (1)	5.23	1.11	22	6.26	1.12	22	23.4%	-0.91 [-1.53 , -0.28]	
McMain 2017 (2)	52.79	9.72	42	56.2	8.54	42	48.9%	-0.37 [-0.80 , 0.06]	
Zanarini 2008 (3)	-0.43	0.94	30	0.05	1.1	20	27.7%	-0.47 [-1.04 , 0.10]	
Subtotal (95% CI)			**94**			**84**	**100.0%**	**-0.52 [-0.82 , -0.22]**	
Heterogeneity: Tau² = 0.00; Chi² = 1.98, df = 2 (P = 0.37); I² = 0%									
Test for overall effect: Z = 3.40 (P = 0.0007)									
15.8.2 0-6 months follow-up									
Bellino 2010 (1)	5.1	1.21	16	6.2	1.16	14	100.0%	-0.90 [-1.66 , -0.14]	
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.90 [-1.66 , -0.14]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 2.33 (P = 0.02)									
15.8.3 6-12 months follow-up									
Bellino 2010 (1)	4.95	1.45	16	6.05	1.22	14	100.0%	-0.79 [-1.54 , -0.04]	
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.79 [-1.54 , -0.04]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 2.08 (P = 0.04)									
15.8.4 Above 12 months follow-up									
Bellino 2010 (1)	4.89	1.52	16	5.98	1.26	14	100.0%	-0.75 [-1.50 , -0.01]	
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.75 [-1.50 , -0.01]**	
Heterogeneity: Not applicable									
Test for overall effect: Z = 1.98 (P = 0.05)									



Footnotes

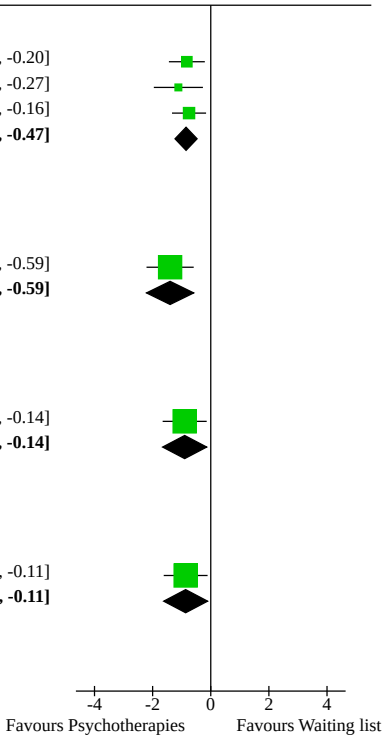
(1) Observer rated: BPDSI-V - impulsivity

(2) Self rated: BIS-11

(3) ZAN-BPD-impulsivity (effects calculated from baseline-to-endpoint change scores)

Analysis 15.9. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 9: Secondary: interpersonal problems (continuous)

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
15.9.1 End of treatment								
Bellino 2010 (1)	5.83	1.42	22	6.97	1.3	22	37.8%	-0.82 [-1.44 , -0.20]
Haeyen 2018 (2)	14.2	3.03	15	19.09	5.52	11	20.2%	-1.11 [-1.96 , -0.27]
Zanarini 2008 (3)	-0.93	0.94	30	-0.05	1.43	20	42.0%	-0.75 [-1.33 , -0.16]
Subtotal (95% CI)			**67**			**53**	**100.0%**	**-0.85 [-1.23 , -0.47]**
Heterogeneity: Tau² = 0.00; Chi² = 0.50, df = 2 (P = 0.78); I² = 0%								
Test for overall effect: Z = 4.39 (P < 0.0001)								
15.9.2 0-6 months follow-up								
Bellino 2010 (1)	5.03	1.51	16	7.03	1.24	14	100.0%	-1.40 [-2.21 , -0.59]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.40 [-2.21 , -0.59]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.38 (P = 0.0007)								
15.9.3 6-12 months follow-up								
Bellino 2010 (1)	5.45	1.99	16	7.01	1.26	14	100.0%	-0.90 [-1.66 , -0.14]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.90 [-1.66 , -0.14]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.32 (P = 0.02)								
15.9.4 Above 12 months follow-up								
Bellino 2010 (1)	5.72	2.01	16	7.2	1.15	14	100.0%	-0.86 [-1.62 , -0.11]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.86 [-1.62 , -0.11]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.24 (P = 0.02)								



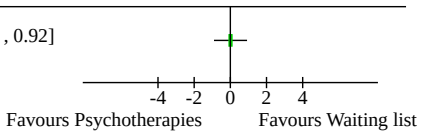
Footnotes

(1) Observer rated: BPDS-IV interpersonal relationships
(2) Self reported: OQ45, interpersonal relations
(3) Zan-BPD - stormy relatioships (effect based on baseline-to-endpoint change scores)

Analysis 15.10. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 10: Secondary: abandonment (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	6.11	1.57	22	6.1	1.52	22	0.01 [-0.90 , 0.92]

Test for subgroup differences: Not applicable



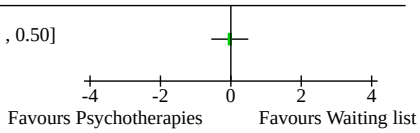
Footnotes

(1) Observer rated: BPDSI-IV abandonment

Analysis 15.11. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 11: Secondary: identity disturbance (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	2.46	0.9	22	2.49	0.88	22	-0.03 [-0.56 , 0.50]

Test for subgroup differences: Not applicable



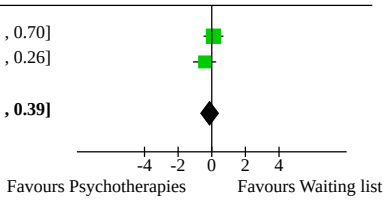
Footnotes

(1) Observer rated: BPDSI-IV identity disturbance

Analysis 15.12. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 12: Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bellino 2010 (1)	4.32	2.11	22	4.09	2.24	22	55.9%	0.10 [-0.49 , 0.70]
Bohus 2013 (2)	24.35	14.79	17	30.8	14.68	16	44.1%	-0.43 [-1.12 , 0.26]
Total (95% CI)			**39**			**38**	**100.0%**	**-0.13 [-0.65 , 0.39]**

Heterogeneity: Tau² = 0.03; Chi² = 1.31, df = 1 (P = 0.25); I² = 24%
Test for overall effect: Z = 0.49 (P = 0.62)
Test for subgroup differences: Not applicable



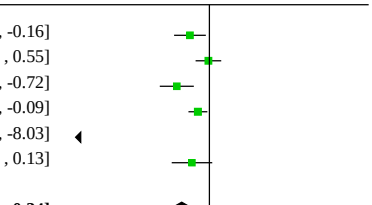
Footnotes

(1) Observer rated: BPDSI-IV paranoid ideation
(2) Self rated: DES

Analysis 15.13. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 13: Secondary: depression (continuous), at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	Waiting list/no treatment Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bellino 2006 (1)	9.1	3	16	12	3.3	16	18.9%	-0.90 [-1.63 , -0.16]
Bellino 2010 (2)	10.75	1.5	22	10.82	1.53	22	19.7%	-0.05 [-0.64 , 0.55]
Bohus 2013 (3)	25.32	11.79	17	41.75	9.31	16	18.6%	-1.50 [-2.29 , -0.72]
McMain 2017 (3)	22.76	12.55	42	29.73	13.5	42	20.4%	-0.53 [-0.97 , -0.09]
Mohamadizadeh 2017 (4)	24.16	2.7	12	53.75	2.13	12	4.8%	-11.75 [-15.47 , -8.03]
Smith 2012 (1)	18.7	6.2	15	23.3	3.4	7	17.6%	-0.80 [-1.74 , 0.13]
Total (95% CI)			**124**			**115**	**100.0%**	**-1.28 [-2.21 , -0.34]**

Heterogeneity: Tau² = 1.06; Chi² = 43.48, df = 5 (P < 0.00001); I² = 89%
Test for overall effect: Z = 2.68 (P = 0.007)
Test for subgroup differences: Not applicable



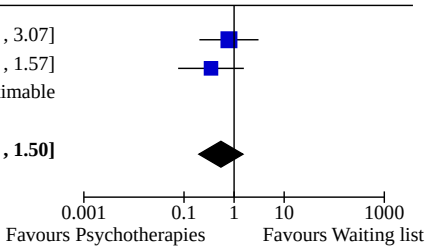
Footnotes

(1) Ham-D (CR)
(2) Observer rated: Ham-D
(3) Self rated: BDI-II
(4) Self rated: BDI

Analysis 15.14. Comparison 15: Psychotherapy vs waiting list or no treatment, Outcome 14: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	Psychotherapies Events	Total	Waiting list Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Bellino 2006	3	19	4	20	55.3%	0.79 [0.20 , 3.07]
Bellino 2010	2	27	6	28	44.7%	0.35 [0.08 , 1.57]
Zanarini 2008 (1)	0	30	0	20		Not estimable
Total (95% CI)		**76**		**68**	**100.0%**	**0.55 [0.20 , 1.50]**
Total events:	5		10			

Heterogeneity: Tau² = 0.00; Chi² = 0.64, df = 1 (P = 0.42); I² = 0%
Test for overall effect: Z = 1.18 (P = 0.24)
Test for subgroup differences: Not applicable



Footnotes
(1) all participants attended all visits, no drop-outs

Comparison 16. Dialectical behavior therapy (DBT) vs waiting list or no treatment

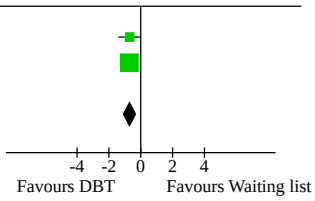
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
16.1 Primary: BPD symptom severity (continuous), at end of treatment	2	117	Std. Mean Difference (IV, Random, 95% CI)	-0.71 [-1.08, -0.33]
16.2 Primary: self-harm (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
16.3 Primary: suicide-related outcomes (continuous), at end of treatment	2	108	Std. Mean Difference (IV, Random, 95% CI)	-5.62 [-16.39, 5.16]
16.4 Primary: psychosocial functioning (continuous), at end of treatment	2	117	Std. Mean Difference (IV, Random, 95% CI)	-0.73 [-1.11, -0.36]
16.5 Secondary: anger (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
16.6 Secondary: affective instability (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
16.7 Secondary: impulsivity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
16.8 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
16.9 Secondary: depression (continuous), at end of treatment	3	141	Std. Mean Difference (IV, Random, 95% CI)	-3.20 [-5.57, -0.83]
16.10 DBT-couple therapy (CDBT) vs waiting list (generic inverse variance)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
16.10.1 Primary: BPD severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-27.15 [-31.59, -22.71]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
16.10.2 Primary: suicide-related outcomes (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-0.94 [-1.24, -0.64]
16.10.3 Primary: psychosocial functioning (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-10.70 [-12.31, -9.09]
16.10.4 Secondary: anger (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-1.42 [-1.72, -1.12]
16.10.5 Secondary: affective instability (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-4.01 [-5.44, -2.58]
16.10.6 Secondary: chronic feelings of emptiness (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-3.54 [-4.81, -2.27]
16.10.7 Secondary: impulsivity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-0.51 [-0.72, -0.30]
16.10.8 Secondary: interpersonal problems (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-1.98 [-2.47, -1.49]
16.10.9 Secondary: abandonment (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-0.86 [-1.09, -0.63]
16.10.10 Secondary: identity disturbance (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-2.44 [-2.77, -2.11]
16.10.11 Secondary: dissociation or psychotic-like symptoms (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-1.92 [-2.46, -1.38]
16.10.12 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	-10.43 [-11.86, -9.00]

Analysis 16.1. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

	DBT			Waiting list				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Random, 95% CI	IV, Random, 95% CI
Bohus 2013 (1)	3.24	2.14	17	4.62	1.67	16	28.1%	-0.70 [-1.40 , 0.01]	
McMain 2017 (2)	33.72	18.7	42	48.48	22.21	42	71.9%	-0.71 [-1.15 , -0.27]	
Total (95% CI)			**59**			**58**	**100.0%**	**-0.71 [-1.08 , -0.33]**	

Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.97); I² = 0%
Test for overall effect: Z = 3.71 (P = 0.0002)
Test for subgroup differences: Not applicable

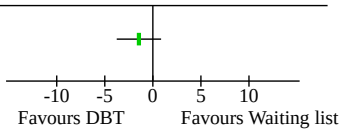


Footnotes
(1) IPDE-BPD criteria (CR)
(2) Self rated: BSL

Analysis 16.2. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 2: Primary: self-harm (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI
McMain 2017 (1)	1.14	3.26	42	2.59	6.9	42	-1.45 [-3.76 , 0.86]

Test for subgroup differences: Not applicable

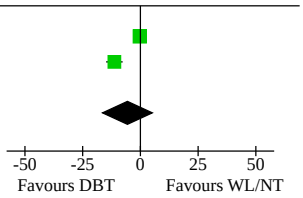


Footnotes
(1) Self rated: DSHI

Analysis 16.3. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 3: Primary: suicide-related outcomes (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list/no treatment Mean	Waiting list/no treatment SD	Waiting list/no treatment Total	Weight	Std. Mean Difference IV, Random, 95% CI
McMain 2017 (1)	1.14	3.26	42	2.59	6.9	42	51.4%	-0.27 [-0.70 , 0.16]
Mohamadizadeh 2017 (2)	15.25	1.65	12	31	0.96	12	48.6%	-11.27 [-14.84 , -7.69]
Total (95% CI)			**54**			**54**	**100.0%**	**-5.62 [-16.39 , 5.16]**

Heterogeneity: Tau² = 58.81; Chi² = 35.82, df = 1 (P < 0.00001); I² = 97%
Test for overall effect: Z = 1.02 (P = 0.31)
Test for subgroup differences: Not applicable

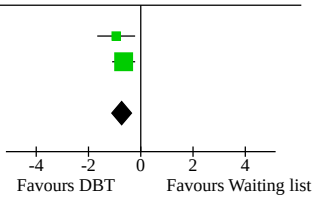


Footnotes
(1) Clinician rated: LSASI
(2) Self reported: BSS

Analysis 16.4. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 4: Primary: psychosocial functioning (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bohus 2013 (1)	-47.88	7.8	17	-40.88	6.64	16	26.9%	-0.94 [-1.66 , -0.22]
McMain 2017 (2)	2.5	0.56	42	2.88	0.59	42	73.1%	-0.65 [-1.09 , -0.22]
Total (95% CI)			**59**			**58**	**100.0%**	**-0.73 [-1.11 , -0.36]**

Heterogeneity: Tau² = 0.00; Chi² = 0.44, df = 1 (P = 0.51); I² = 0%
Test for overall effect: Z = 3.82 (P = 0.0001)
Test for subgroup differences: Not applicable

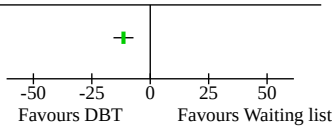


Footnotes
(1) Clinician rated: GAF
(2) Self rated: SAS-SR

Analysis 16.5. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 5: Secondary: anger (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
McMain 2017 (1)	29.73	9.27	42	41.18	10.68	42	-11.45 [-15.73 , -7.17]	

Test for subgroup differences: Not applicable

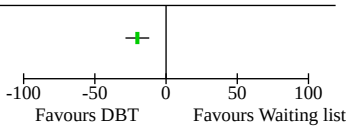


Footnotes
(1) Self rated: STAXI, trait anger

Analysis 16.6. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 6: Secondary: affective instability (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
McMain 2017 (1)	106.55	20.22	42	126.7	18.76	42	-20.15 [-28.49 , -11.81]	

Test for subgroup differences: Not applicable

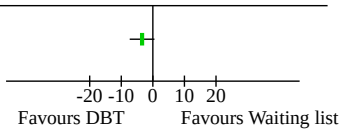


Footnotes
(1) Self rated: DERS

Analysis 16.7. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 7: Secondary: impulsivity (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
McMain 2017 (1)	52.79	9.72	42	56.2	8.54	42	-3.41 [-7.32 , 0.50]	

Test for subgroup differences: Not applicable

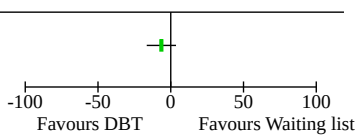


Footnotes
(1) Self rated: BIS-11

Analysis 16.8. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 8: Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment

Study or Subgroup	DBT Mean	DBT SD	DBT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Bohus 2013 (1)	24.35	14.79	17	30.8	14.68	16	-6.45 [-16.51 , 3.61]	

Test for subgroup differences: Not applicable

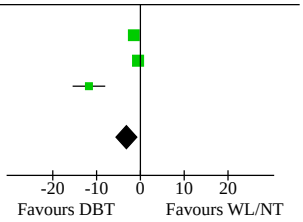


Footnotes
(1) Self rated: DES

Analysis 16.9. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 9: Secondary: depression (continuous), at end of treatment

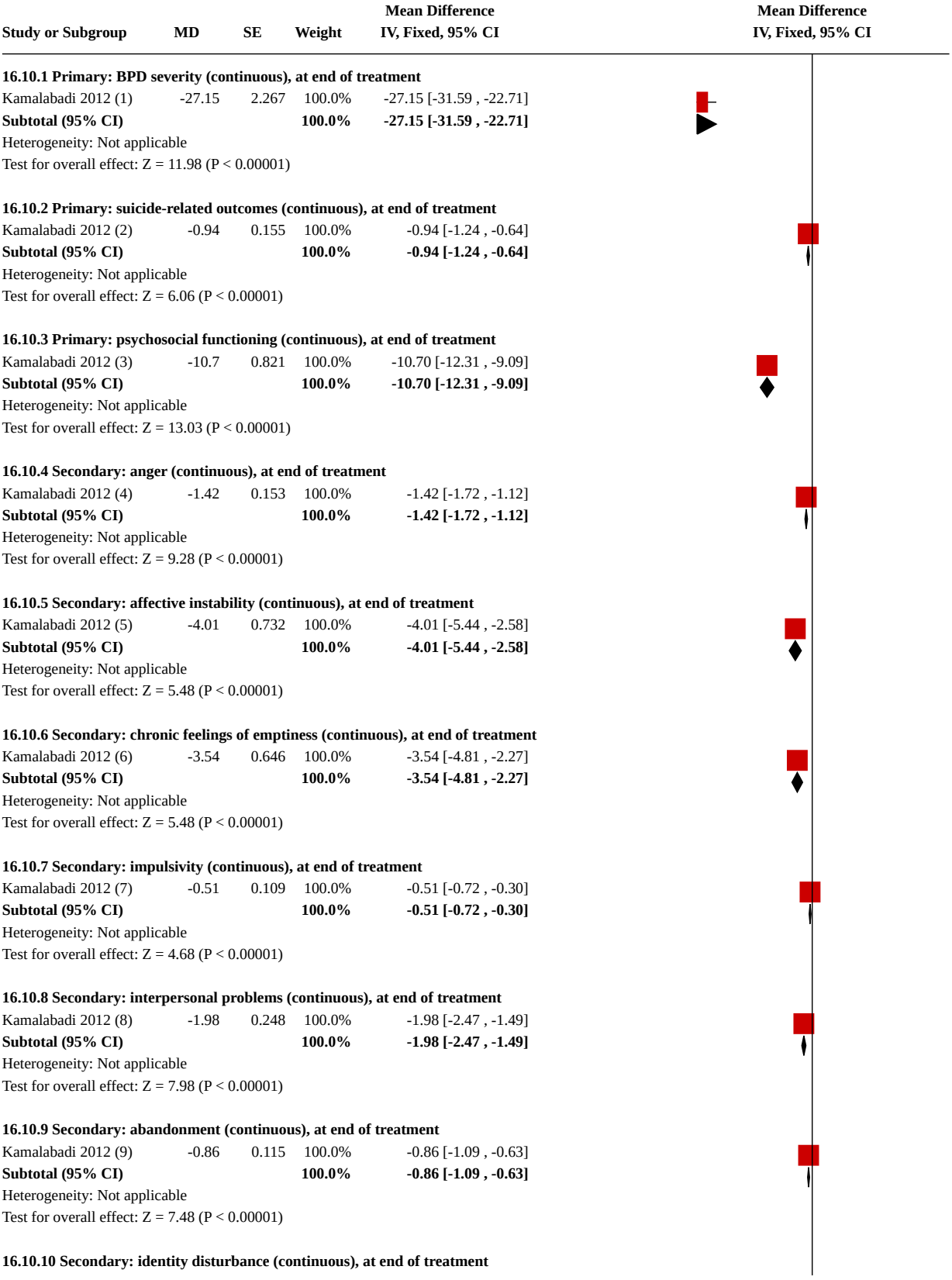
	DBT			Waiting list/no treatment				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Bohus 2013 (1)	25.32	11.79	17	41.75	9.31	16	39.2%	-1.50 [-2.29 , -0.72]	
McMain 2017 (1)	22.76	12.55	42	29.73	13.5	42	40.4%	-0.53 [-0.97 , -0.09]	
Mohamadizadeh 2017 (2)	24.16	2.7	12	53.75	2.13	12	20.4%	-11.75 [-15.47 , -8.03]	
Total (95% CI)			**71**			**70**	**100.0%**	**-3.20 [-5.57 , -0.83]**	

Heterogeneity: Tau² = 3.57; Chi² = 37.66, df = 2 (P < 0.00001); I² = 95%
Test for overall effect: Z = 2.64 (P = 0.008)
Test for subgroup differences: Not applicable



Footnotes
(1) Self rated: BDI-II
(2) Self rated: BDI

Analysis 16.10. Comparison 16: Dialectical behavior therapy (DBT) vs waiting list or no treatment, Outcome 10: DBT-couple therapy (CDBT) vs waiting list (generic inverse variance)



Analysis 16.10. (Continued)

16.10.10 Secondary: identity disturbance (continuous), at end of treatment

Kamalabadi 2012 (10)	-2.44	0.169	100.0%	-2.44 [-2.77 , -2.11]
Subtotal (95% CI)			**100.0%**	**-2.44 [-2.77 , -2.11]**

Heterogeneity: Not applicable
Test for overall effect: Z = 14.44 (P < 0.00001)

16.10.11 Secondary: dissociation or psychotic-like symptoms (continuous), at end of treatment

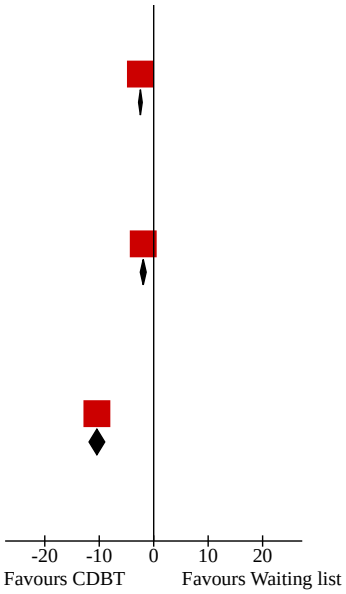
Kamalabadi 2012 (11)	-1.92	0.273	100.0%	-1.92 [-2.46 , -1.38]
Subtotal (95% CI)			**100.0%**	**-1.92 [-2.46 , -1.38]**

Heterogeneity: Not applicable
Test for overall effect: Z = 7.03 (P < 0.00001)

16.10.12 Secondary: depression (continuous), at end of treatment

Kamalabadi 2012 (12)	-10.43	0.732	100.0%	-10.43 [-11.86 , -9.00]
Subtotal (95% CI)			**100.0%**	**-10.43 [-11.86 , -9.00]**

Heterogeneity: Not applicable
Test for overall effect: Z = 14.25 (P < 0.00001)



Footnotes

(1) Observer rated: BPDSI-IV, total score
(2) Observer rated: BPDSI, parasuicidal
(3) Observer rated: GHQ, functioning
(4) Observer rated: BPDSI-IV, anger
(5) Observer rated: BPDSI-IV, affect
(6) Observer rated: BPDSI-IV, emptiness
(7) Observer rated: BPDSI-IV, impulsivity
(8) Observer rated: BPDSI, interpersonal
(9) Observer rated: BPDSI, abandonment
(10) Observer rated: BPDSI, identity
(11) Observer rated: BPDSI, dissociation
(12) Self-rated: GHQ, depression

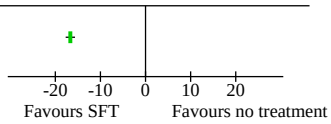
Comparison 17. Schema-focused therapy (SFT) vs no treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
17.1 Primary: suicide-related outcomes (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
17.2 Secondary: depression (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Analysis 17.1. Comparison 17: Schema-focused therapy (SFT) vs no treatment, Outcome 1: Primary: suicide-related outcomes (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	No treatment Mean	No treatment SD	No treatment Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Mohamadizadeh 2017 (1)	14.33	1.55	12	31	0.96	12	-16.67 [-17.70 , -15.64]	

Test for subgroup differences: Not applicable

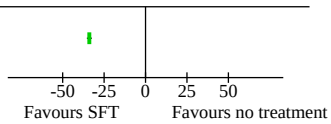


Footnotes
(1) Self rated: BSS

Analysis 17.2. Comparison 17: Schema-focused therapy (SFT) vs no treatment, Outcome 2: Secondary: depression (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	No treatment Mean	No treatment SD	No treatment Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Mohamadizadeh 2017 (1)	19.83	1.53	12	53.75	2.13	12	-33.92 [-35.40 , -32.44]	

Test for subgroup differences: Not applicable



Footnotes
(1) Self rated: BDI

Comparison 18. Interpersonal psychotherapy (IPT) vs waiting list

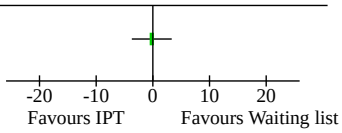
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
18.1 Primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.2 Primary: self-harm (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.3 Primary: psychosocial functioning (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
18.3.1 End of treatment	2	76	Std. Mean Difference (IV, Random, 95% CI)	-0.03 [-0.48, 0.42]
18.3.2 0-6 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-0.89 [-1.65, -0.13]
18.3.3 6-12 months follow-up	1	30	Std. Mean Difference (IV, Random, 95% CI)	-1.04 [-1.81, -0.27]
18.3.4 Above 12 months follow-up	1	28	Std. Mean Difference (IV, Random, 95% CI)	-0.38 [-1.14, 0.37]
18.4 Secondary: anger (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.5 Secondary: affective instability (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
18.5.1 End of treatment	1	44	Mean Difference (IV, Fixed, 95% CI)	-1.02 [-1.66, -0.38]
18.5.2 0-6 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-0.46 [-1.15, 0.23]
18.5.3 6-12 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-0.39 [-1.12, 0.34]
18.5.4 Above 12 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-0.34 [-1.17, 0.49]
18.6 Secondary: chronic feelings of emptiness (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.7 Secondary: impulsivity (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.7.1 End of treatment	1	44	Mean Difference (IV, Fixed, 95% CI)	-1.03 [-1.69, -0.37]
18.7.2 0-6 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-1.10 [-1.95, -0.25]
18.7.3 6-12 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-1.10 [-2.06, -0.14]
18.7.4 Above 12 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-1.09 [-2.09, -0.09]
18.8 Secondary: interpersonal problems (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.8.1 End of treatment	1	44	Mean Difference (IV, Fixed, 95% CI)	-1.14 [-1.94, -0.34]
18.8.2 0-6 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-2.00 [-2.98, -1.02]
18.8.3 6-12 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-1.56 [-2.74, -0.38]
18.8.4 Above 12 months follow-up	1	30	Mean Difference (IV, Fixed, 95% CI)	-1.48 [-2.63, -0.33]
18.9 Secondary: abandonment (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.10 Secondary: identity disturbance (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
18.11 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
18.12 Secondary outcome: depression (continuous), at end of treatment	3	98	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-1.11, 0.06]
18.13 Secondary outcome: attrition (dichotomous), at end of treatment	2	94	Risk Ratio (M-H, Random, 95% CI)	0.55 [0.20, 1.50]

Analysis 18.1. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 1: Primary: BPD symptom severity (continuous), at end of treatment

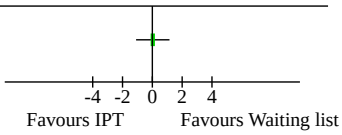
Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	33.27	5.96	22	33.46	5.95	22	-0.19 [-3.71 , 3.33]	
Test for subgroup differences: Not applicable								



Footnotes
(1) Clinician rated: BPDSI-IV

Analysis 18.2. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 2: Primary: self-harm (continuous), at end of treatment

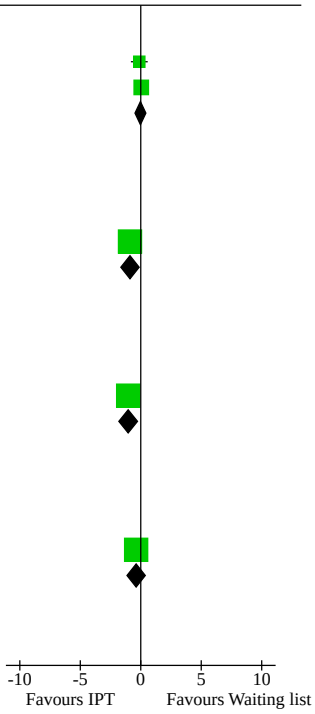
Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	2.02	1.92	22	1.99	1.87	22	0.03 [-1.09 , 1.15]	
Test for subgroup differences: Not applicable								



Footnotes
(1) Clinician rated: BPDSI-IV, parasuicidal behaviour

Analysis 18.3. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 3: Primary: psychosocial functioning (continuous)

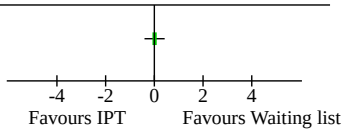
Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Weight	Std. Mean Difference IV, Random, 95% CI
18.3.1 End of treatment								
Bellino 2006 (1)	2.9	0.9	16	3	0.7	16	42.1%	-0.12 [-0.81 , 0.57]
Bellino 2010 (2)	4.37	0.49	22	4.35	0.48	22	57.9%	0.04 [-0.55 , 0.63]
Subtotal (95% CI)			**38**			**38**	**100.0%**	**-0.03 [-0.48 , 0.42]**
Heterogeneity: Tau² = 0.00; Chi² = 0.12, df = 1 (P = 0.73); I² = 0%								
Test for overall effect: Z = 0.12 (P = 0.91)								
18.3.2 0-6 months follow-up								
Bellino 2010 (3)	-67.99	14.45	16	-55.6	12.4	14	100.0%	-0.89 [-1.65 , -0.13]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.89 [-1.65 , -0.13]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.31 (P = 0.02)								
18.3.3 6-12 months follow-up								
Bellino 2010 (3)	-70.12	13.2	16	-56.53	12.1	14	100.0%	-1.04 [-1.81 , -0.27]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.04 [-1.81 , -0.27]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.65 (P = 0.008)								
18.3.4 Above 12 months follow-up								
Bellino 2010 (3)	-70	13.1	16	-55.32	55.32	12	100.0%	-0.38 [-1.14 , 0.37]
Subtotal (95% CI)			**16**			**12**	**100.0%**	**-0.38 [-1.14 , 0.37]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.99 (P = 0.32)								



Footnotes
(1) Clinician rated: CGI-S
(2) Observer rated:CGI-S
(3) SAT-P social functioning

Analysis 18.4. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 4: Secondary: anger (continuous), at end of treatment

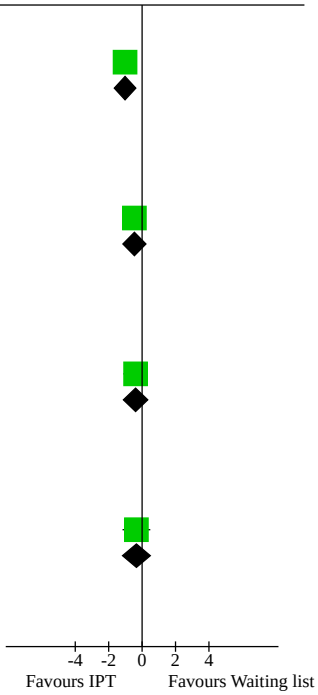
Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	5.26	0.71	22	5.25	0.69	22	0.01 [-0.40 , 0.42]
Test for subgroup differences: Not applicable							



Footnotes
(1) Observer rated: BPDSI-IV, anger

Analysis 18.5. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 5: Secondary: affective instability (continuous)

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Weight	Mean Difference IV, Fixed, 95% CI
18.5.1 End of treatment								
Bellino 2010 (1)	5.61	1.18	22	6.63	0.99	22	100.0%	-1.02 [-1.66 , -0.38]
Subtotal (95% CI)			**22**			**22**	**100.0%**	**-1.02 [-1.66 , -0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.11 (P = 0.002)								
18.5.2 0-6 months follow-up								
Bellino 2010 (2)	5.96	0.9	16	6.42	1.01	14	100.0%	-0.46 [-1.15 , 0.23]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.46 [-1.15 , 0.23]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.31 (P = 0.19)								
18.5.3 6-12 months follow-up								
Bellino 2010 (2)	5.99	0.88	16	6.38	1.12	14	100.0%	-0.39 [-1.12 , 0.34]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.39 [-1.12 , 0.34]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.05 (P = 0.29)								
18.5.4 Above 12 months follow-up								
Bellino 2010 (2)	6.06	1.22	16	6.4	1.1	14	100.0%	-0.34 [-1.17 , 0.49]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-0.34 [-1.17 , 0.49]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.80 (P = 0.42)								



Footnotes

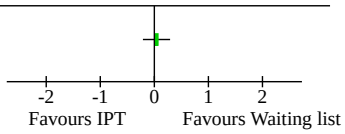
(1) Observer rated: BPDSI-IV, affective instability

(2) Observer rated: BPDSI-IV affective instability

Analysis 18.6. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 6: Secondary: chronic feelings of emptiness (continuous), at end of treatment

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	7.16	0.42	22	7.12	0.43	22	0.04 [-0.21 , 0.29]

Test for subgroup differences: Not applicable

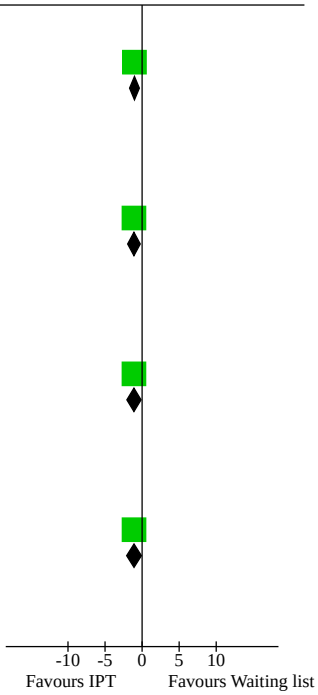


Footnotes

(1) Observer rated: BPDSI-IV, chronic feelings of emptiness

Analysis 18.7. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 7: Secondary: impulsivity (continuous)

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Weight	Mean Difference IV, Fixed, 95% CI
18.7.1 End of treatment								
Bellino 2010 (1)	5.23	1.11	22	6.26	1.12	22	100.0%	-1.03 [-1.69 , -0.37]
Subtotal (95% CI)			**22**			**22**	**100.0%**	**-1.03 [-1.69 , -0.37]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.06 (P = 0.002)								
18.7.2 0-6 months follow-up								
Bellino 2010 (1)	5.1	1.21	16	6.2	1.16	14	100.0%	-1.10 [-1.95 , -0.25]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.10 [-1.95 , -0.25]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.54 (P = 0.01)								
18.7.3 6-12 months follow-up								
Bellino 2010 (1)	4.95	1.45	16	6.05	1.22	14	100.0%	-1.10 [-2.06 , -0.14]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.10 [-2.06 , -0.14]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.26 (P = 0.02)								
18.7.4 Above 12 months follow-up								
Bellino 2010 (1)	4.89	1.52	16	5.98	1.26	14	100.0%	-1.09 [-2.09 , -0.09]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.09 [-2.09 , -0.09]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.15 (P = 0.03)								

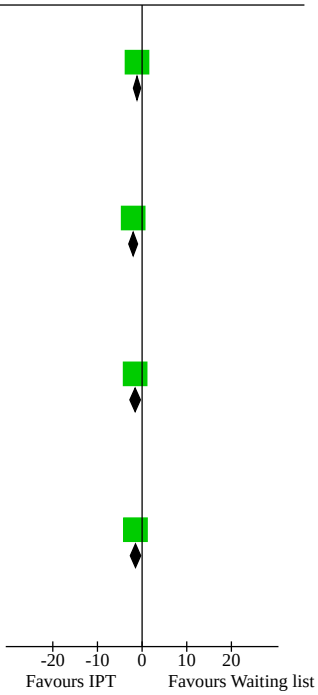


Footnotes

(1) Observer rated: BPDSI-V - impulsivity

Analysis 18.8. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 8: Secondary: interpersonal problems (continuous)

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Weight	Mean Difference IV, Fixed, 95% CI
18.8.1 End of treatment								
Bellino 2010 (1)	5.83	1.42	22	6.97	1.3	22	100.0%	-1.14 [-1.94 , -0.34]
Subtotal (95% CI)			**22**			**22**	**100.0%**	**-1.14 [-1.94 , -0.34]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.78 (P = 0.005)								
18.8.2 0-6 months follow-up								
Bellino 2010 (1)	5.03	1.51	16	7.03	1.24	14	100.0%	-2.00 [-2.98 , -1.02]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-2.00 [-2.98 , -1.02]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.98 (P < 0.0001)								
18.8.3 6-12 months follow-up								
Bellino 2010 (1)	5.45	1.99	16	7.01	1.26	14	100.0%	-1.56 [-2.74 , -0.38]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.56 [-2.74 , -0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.60 (P = 0.009)								
18.8.4 Above 12 months follow-up								
Bellino 2010 (1)	5.72	2.01	16	7.2	1.15	14	100.0%	-1.48 [-2.63 , -0.33]
Subtotal (95% CI)			**16**			**14**	**100.0%**	**-1.48 [-2.63 , -0.33]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.51 (P = 0.01)								

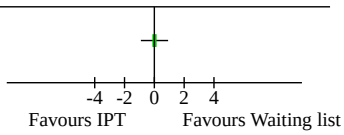


Footnotes

(1) Observer rated: BPDS-IV interpersonal relationships

Analysis 18.9. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 9: Secondary: abandonment (continuous), at end of treatment

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	6.11	1.57	22	6.1	1.52	22	0.01 [-0.90 , 0.92]
Test for subgroup differences: Not applicable							

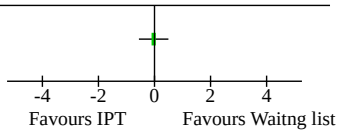


Footnotes

(1) Observer rated: BPDSI-IV abandonment

Analysis 18.10. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 10: Secondary: identity disturbance (continuous), at end of treatment

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	2.46	0.9	22	2.49	0.88	22	-0.03 [-0.56 , 0.50]
Test for subgroup differences: Not applicable							



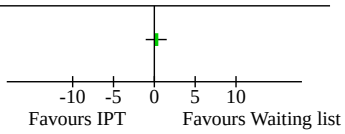
Footnotes

(1) Observer rated: BPDSI-IV identity disturbance

Analysis 18.11. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 11: Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Mean Difference IV, Fixed, 95% CI
Bellino 2010 (1)	4.32	2.11	22	4.09	2.24	22	0.23 [-1.06 , 1.52]

Test for subgroup differences: Not applicable



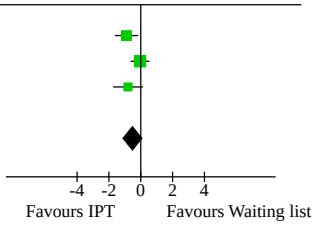
Footnotes

(1) Observer rated: BPDSI-IV paranoid ideation

Analysis 18.12. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 12: Secondary outcome: depression (continuous), at end of treatment

Study or Subgroup	IPT Mean	IPT SD	IPT Total	Waiting list Mean	Waiting list SD	Waiting list Total	Weight	Std. Mean Difference IV, Random, 95% CI
Bellino 2006 (1)	9.1	3	16	12	3.3	16	33.6%	-0.90 [-1.63 , -0.16]
Bellino 2010 (2)	10.75	1.5	22	10.82	1.53	22	41.1%	-0.05 [-0.64 , 0.55]
Smith 2012 (1)	18.7	6.2	15	23.3	3.4	7	25.2%	-0.80 [-1.74 , 0.13]
Total (95% CI)			**53**			**45**	**100.0%**	**-0.52 [-1.11 , 0.06]**

Heterogeneity: Tau² = 0.13; Chi² = 3.77, df = 2 (P = 0.15); I² = 47%
Test for overall effect: Z = 1.75 (P = 0.08)
Test for subgroup differences: Not applicable



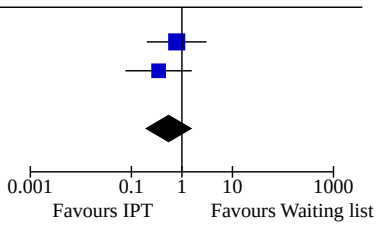
Footnotes

(1) Ham-D (CR)
(2) Observer rated: Ham-D

Analysis 18.13. Comparison 18: Interpersonal psychotherapy (IPT) vs waiting list, Outcome 13: Secondary outcome: attrition (dichotomous), at end of treatment

Study or Subgroup	IPT Events	IPT Total	Waiting list Events	Waiting list Total	Weight	Risk Ratio M-H, Random, 95% CI
Bellino 2006	3	19	4	20	55.3%	0.79 [0.20 , 3.07]
Bellino 2010	2	27	6	28	44.7%	0.35 [0.08 , 1.57]
Total (95% CI)		**46**		**48**	**100.0%**	**0.55 [0.20 , 1.50]**
Total events:	5		10			

Heterogeneity: Tau² = 0.00; Chi² = 0.64, df = 1 (P = 0.42); I² = 0%
Test for overall effect: Z = 1.18 (P = 0.24)
Test for subgroup differences: Not applicable



Comparison 19. Once-only interventions (individual setting) vs waiting list

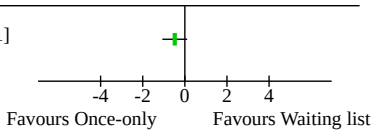
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
19.1 Secondary: impulsivity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
19.2 Secondary: interpersonal problems (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
19.3 Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 19.1. Comparison 19: Once-only interventions (individual setting) vs waiting list, Outcome 1: Secondary: impulsivity (continuous), at end of treatment

Study or Subgroup	Once-only intervention Mean	SD	Total	Waiting list Mean	SD	Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Zanarini 2008 (1)	-0.43	0.94	30	0.05	1.1	20	-0.48 [-1.07 , 0.11]	

Test for subgroup differences: Not applicable



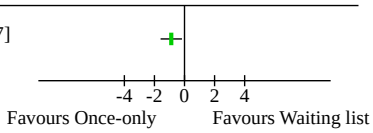
Footnotes

(1) ZAN-BPD-impulsivity (effects calculated from baseline-to-endpoint change scores)

Analysis 19.2. Comparison 19: Once-only interventions (individual setting) vs waiting list, Outcome 2: Secondary: interpersonal problems (continuous), at end of treatment

Study or Subgroup	Once-only intervention Mean	SD	Total	Waiting list Mean	SD	Total	Mean Difference IV, Fixed, 95% CI	Mean Difference IV, Fixed, 95% CI
Zanarini 2008 (1)	-0.93	0.94	30	-0.05	1.43	20	-0.88 [-1.59 , -0.17]	

Test for subgroup differences: Not applicable



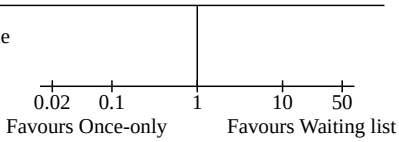
Footnotes

(1) Zan-BPD - stormy relatioships (effect based on baseline-to-endpoint change scores)

Analysis 19.3. Comparison 19: Once-only interventions (individual setting) vs waiting list, Outcome 3: Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	Once-only intervention Events	Total	Waiting list Events	Total	Risk Ratio M-H, Fixed, 95% CI	Risk Ratio M-H, Fixed, 95% CI
Zanarini 2008 (1)	0	30	0	20	Not estimable	

Test for subgroup differences: Not applicable



Footnotes

(1) all participants attended all visits, no drop-outs

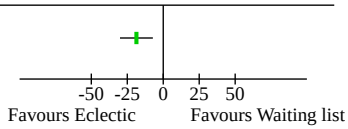
Comparison 20. Eclectic treatments vs waiting list

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
20.1 Primary outcome: psychosocial functioning (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
20.2 Secondary outcome: interpersonal problems (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Analysis 20.1. Comparison 20: Eclectic treatments vs waiting list, Outcome 1: Primary outcome: psychosocial functioning (continuous), at end of treatment

	Eclectic treatments			Waiting list			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Haeyen 2018 (1)	46.27	9.77	15	64.91	17.42	11	-18.64 [-30.06 , -7.22]	

Test for subgroup differences: Not applicable

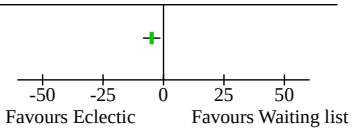


Footnotes
(1) Self reported: OQ45, total score

Analysis 20.2. Comparison 20: Eclectic treatments vs waiting list, Outcome 2: Secondary outcome: interpersonal problems (continuous), at end of treatment

	Eclectic treatments			Waiting list			Mean Difference	Mean Difference
Study or Subgroup	Mean	SD	Total	Mean	SD	Total	IV, Fixed, 95% CI	IV, Fixed, 95% CI
Haeyen 2018 (1)	14.2	3.03	15	19.09	5.52	11	-4.89 [-8.49 , -1.29]	

Test for subgroup differences: Not applicable



Footnotes
(1) Self reported: OQ45, interpersonal relations

Comparison 21. Dialectical behavior therapy (DBT) and related treatments vs active treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
21.1 Standard DBT (DBT) vs client-centred therapy (CCT) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.1.1 Primary: self-harm (continuous), at end of treatment	1	24	Mean Difference (IV, Fixed, 95% CI)	-2.75 [-4.42, -1.08]
21.1.2 Primary: suicide-related outcomes (continuous), at end of treatment	1	24	Mean Difference (IV, Fixed, 95% CI)	-7.75 [-14.66, -0.84]
21.1.3 Secondary: anger (continuous), at end of treatment	1	24	Mean Difference (IV, Fixed, 95% CI)	-1.00 [-1.98, -0.02]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
21.1.4 Secondary: impulsivity (continuous), at end of treatment	1	24	Mean Difference (IV, Fixed, 95% CI)	-1.50 [-2.60, -0.40]
21.1.5 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	1	24	Mean Difference (IV, Fixed, 95% CI)	-7.16 [-12.15, -2.17]
21.1.6 Secondary: depression (continuous), at end of treatment	1	24	Mean Difference (IV, Fixed, 95% CI)	-9.16 [-14.79, -3.53]
21.2 DBT vs CCT, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
21.3 Standard DBT (DBT) vs good psychiatric management (GPM) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.3.1 Primary: BPD severity (continuous), at end of treatment	1	180	Mean Difference (IV, Fixed, 95% CI)	-0.23 [-1.97, 1.51]
21.3.2 Primary: self-harm (continuous), at end of treatment	1	180	Mean Difference (IV, Fixed, 95% CI)	-8.58 [-19.38, 2.22]
21.3.3 Secondary: anger (continuous), at end of treatment	1	180	Mean Difference (IV, Fixed, 95% CI)	-0.15 [-1.65, 1.35]
21.3.4 Secondary: interpersonal problems (continuous), at end of treatment	1	180	Mean Difference (IV, Fixed, 95% CI)	-1.34 [-15.36, 12.68]
21.3.5 Secondary: depression (continuous), at end of treatment	1	180	Mean Difference (IV, Fixed, 95% CI)	-2.65 [-7.18, 1.88]
21.4 DBT vs GPM, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
21.5 Standard DBT (DBT) vs individual DBT therapy + activities group (DBT-I) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.5.1 Primary: self-harm (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	-10.40 [-22.99, 2.19]
21.5.2 Primary: self-harm (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	-8.10 [-19.59, 3.39]
21.5.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	0.50 [-1.37, 2.37]
21.5.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	-1.60 [-2.79, -0.41]
21.5.5 Secondary: depression (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	-5.90 [-9.74, -2.06]
21.5.6 Secondary: depression (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	1.30 [-3.10, 5.70]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
21.6 DBT vs DBT-I, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
21.7 Standard DBT (DBT) vs skills training group + individual case management (DBT-S) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.7.1 Primary: self-harm (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	0.30 [-8.42, 9.02]
21.7.2 Primary: self-harm (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	-1.50 [-9.04, 6.04]
21.7.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	0.80 [-1.06, 2.66]
21.7.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	0.50 [-0.02, 1.02]
21.7.5 Secondary: depression (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	1.90 [-1.60, 5.40]
21.7.6 Secondary: depression (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	3.30 [-0.90, 7.50]
21.8 DBT vs DBT-S, secondary: attrition (dichotomous), at 6-12 months follow-up	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
21.9 Standard DBT (DBT) vs step-down DBT (DBT-SD) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.9.1 Primary: BPD symptom severity (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	-2.83 [-11.21, 5.55]
21.9.2 Primary: self-harm (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	4.10 [-4.07, 12.27]
21.9.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	0.30 [-0.73, 1.33]
21.9.4 Secondary: anger (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	-0.53 [-1.48, 0.43]
21.9.5 Secondary: affective instability (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	-0.71 [-2.51, 1.09]
21.9.6 Secondary: chronic feeling of emptiness (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	0.18 [-1.68, 2.04]
21.9.7 Secondary: impulsivity (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	0.24 [-0.26, 0.75]
21.9.8 Secondary: interpersonal problems (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	-1.31 [-2.05, -0.57]

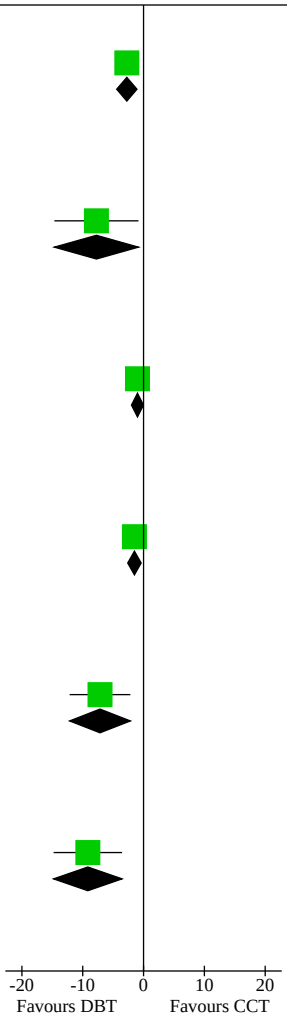
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
21.9.9 Secondary: abandonment (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	-1.11 [-2.14, -0.08]
21.9.10 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment	1	41	Mean Difference (IV, Fixed, 95% CI)	-0.44 [-1.56, 0.68]
21.10 DBT vs DBT-SD, secondary: attrition (dichotomous), at end of treatment	1	84	Risk Ratio (M-H, Fixed, 95% CI)	0.37 [0.17, 0.78]
21.11 Standard DBT (DBT) vs DBT Prolonged Exposure (PE) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.11.1 Primary: self-harm (continuous), end of treatment	1	18	Mean Difference (IV, Fixed, 95% CI)	0.10 [-1.86, 2.06]
21.11.2 Primary: self-harm (continuous), at 0-6 months follow-up	1	18	Mean Difference (IV, Fixed, 95% CI)	-0.30 [-1.09, 0.49]
21.11.3 Primary: suicide-related outcomes (continuous), end of treatment	1	18	Mean Difference (IV, Fixed, 95% CI)	Not estimable
21.11.4 Primary: suicide-related outcomes (continuous), at 0-6 months follow-up	1	18	Mean Difference (IV, Fixed, 95% CI)	Not estimable
21.11.5 Primary: psychosocial functioning (continuous), end of treatment	1	18	Mean Difference (IV, Fixed, 95% CI)	5.27 [-2.06, 12.60]
21.11.6 Primary: psychosocial functioning (continuous), at 0-6 months follow-up	1	18	Mean Difference (IV, Fixed, 95% CI)	2.00 [-6.27, 10.27]
21.11.7 Secondary: interpersonal problems (continuous), end of treatment	1	18	Mean Difference (IV, Fixed, 95% CI)	0.14 [-0.42, 0.70]
21.11.8 Secondary: interpersonal problems (continuous), at 0-6 months follow-up	1	18	Mean Difference (IV, Fixed, 95% CI)	0.19 [-0.48, 0.86]
21.11.9 Secondary: dissociation or psychotic-like symptoms (continuous), end of treatment	1	18	Mean Difference (IV, Fixed, 95% CI)	4.60 [-9.24, 18.44]
21.11.10 Secondary: dissociation or psychotic-like symptoms (continuous), at 0-6 months follow-up	1	18	Mean Difference (IV, Fixed, 95% CI)	6.00 [-9.46, 21.46]
21.11.11 Secondary: depression (continuous), end of treatment	1	18	Mean Difference (IV, Fixed, 95% CI)	3.70 [-3.19, 10.59]
21.11.12 Secondary: depression (continuous), at 0-6 months follow-up	1	18	Mean Difference (IV, Fixed, 95% CI)	4.30 [-1.08, 9.68]
21.12 DBT vs DBT-PE, secondary: attrition (dichotomous), at 0-6 months follow-up	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
21.13 DBT skills group + case management (DBT-S) vs DBT individual therapy + activity group (DBT-I) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.13.1 Primary: self-harm (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	-10.70 [-22.47, 1.07]
21.13.2 Primary: self-harming behaviour (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	-6.60 [-19.72, 6.52]
21.13.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	-0.30 [-1.72, 1.12]
21.13.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	-2.10 [-3.21, -0.99]
21.13.5 Secondary: depression (continuous), at end of treatment	1	66	Mean Difference (IV, Fixed, 95% CI)	-7.80 [-11.27, -4.33]
21.13.6 Secondary: depression (continuous), at 6-12 months follow-up	1	66	Mean Difference (IV, Fixed, 95% CI)	-2.00 [-6.44, 2.44]
21.14 DBT-S vs DBT-I, secondary: attrition (dichotomous), at 6-12 months follow-up	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
21.15 DBT skills group (DBT-S) vs cognitive therapy group (CT-G) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
21.15.1 Primary: BPD symptom severity (continuous), at end of treatment	1	82	Mean Difference (IV, Fixed, 95% CI)	0.26 [-0.13, 0.65]
21.15.2 Primary: BPD symptom severity (continuous), at 0-6 months follow-up	1	82	Mean Difference (IV, Fixed, 95% CI)	-0.96 [-1.15, -0.77]
21.15.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	82	Mean Difference (IV, Fixed, 95% CI)	0.46 [-2.47, 3.39]
21.15.4 Primary: suicide-related outcomes (continuous), at 0-6 months follow-up	1	82	Mean Difference (IV, Fixed, 95% CI)	-2.69 [-4.89, -0.49]
21.15.5 Secondary: depression (continuous), at end of treatment	1	82	Mean Difference (IV, Fixed, 95% CI)	-2.12 [-5.25, 1.01]
21.15.6 Secondary: depression (continuous), at 0-6 months follow-up	1	82	Mean Difference (IV, Fixed, 95% CI)	-1.60 [-5.07, 1.87]
21.16 DBT-S vs CT-G, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Random, 95% CI)	Subtotals only
21.17 DBT skills group (DBT-S) vs schema-focused therapy group (SFT-G)	1		Mean Difference (IV, Random, 95% CI)	Subtotals only
21.17.1 Primary: suicide-related outcomes (continuous), at end of treatment	1	24	Mean Difference (IV, Random, 95% CI)	0.92 [-0.36, 2.20]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
21.17.2 Secondary: depression (continuous), at end of treatment	1	24	Mean Difference (IV, Random, 95% CI)	4.33 [2.57, 6.09]
21.18 DBT mindfulness group (DBT-M) vs DBT interpersonal effectiveness group (DBT-IE) (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
21.18.1 Primary: BPD symptom severity (continuous), at end of treatment	2	113	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-1.47, 0.58]
21.18.2 Secondary: impulsivity (continuous), at end of treatment	2	91	Std. Mean Difference (IV, Random, 95% CI)	-0.36 [-0.77, 0.06]
21.19 DBT-M vs DBT-IE, secondary: attrition (dichotomous), at end of treatment	2	134	Risk Ratio (M-H, Random, 95% CI)	1.86 [1.07, 3.23]
21.20 DBT mindfulness group (DBT-M) vs loving-kindness and compassion meditation (LK/CM), primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only

Analysis 21.1. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 1: Standard DBT (DBT) vs client-centred therapy (CCT) (continuous)

Study or Subgroup	DBT Mean	DBT SD	DBT Total	CCT Mean	CCT SD	CCT Total	Weight	Mean Difference IV, Fixed, 95% CI
21.1.1 Primary: self-harm (continuous), at end of treatment								
Turner 2000 (1)	1.5	1.98	12	4.25	2.18	12	100.0%	-2.75 [-4.42 , -1.08]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**-2.75 [-4.42 , -1.08]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.23 (P = 0.001)								
21.1.2 Primary: suicide-related outcomes (continuous), at end of treatment								
Turner 2000 (2)	3.83	8.03	12	11.58	9.21	12	100.0%	-7.75 [-14.66 , -0.84]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**-7.75 [-14.66 , -0.84]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.20 (P = 0.03)								
21.1.3 Secondary: anger (continuous), at end of treatment								
Turner 2000 (3)	4.67	1.3	12	5.67	1.15	12	100.0%	-1.00 [-1.98 , -0.02]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**-1.00 [-1.98 , -0.02]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.00 (P = 0.05)								
21.1.4 Secondary: impulsivity (continuous), at end of treatment								
Turner 2000 (4)	4.58	1.62	12	6.08	1.08	12	100.0%	-1.50 [-2.60 , -0.40]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**-1.50 [-2.60 , -0.40]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.67 (P = 0.008)								
21.1.5 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment								
Turner 2000 (5)	18.17	7.9	12	25.33	3.94	12	100.0%	-7.16 [-12.15 , -2.17]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**-7.16 [-12.15 , -2.17]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.81 (P = 0.005)								
21.1.6 Secondary: depression (continuous), at end of treatment								
Turner 2000 (6)	14.92	8.26	12	24.08	5.55	12	100.0%	-9.16 [-14.79 , -3.53]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**-9.16 [-14.79 , -3.53]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.19 (P = 0.001)								



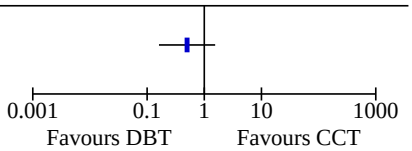
Footnotes

(1) Target Behaviour Rating (TBR) - frequency of parasuicide
(2) BSS (Beck Scale for Suicidal Ideation)
(3) TBR - anger
(4) TBR - impulsiveness
(5) Brief Psychiatric Rating Scale (BPRS)
(6) BDI

Analysis 21.2. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 2: DBT vs CCT, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	CCT Events	CCT Total	Risk Ratio M-H, Fixed, 95% CI
Turner 2000 (1)	3	12	6	12	0.50 [0.16 , 1.55]

Test for subgroup differences: Not applicable

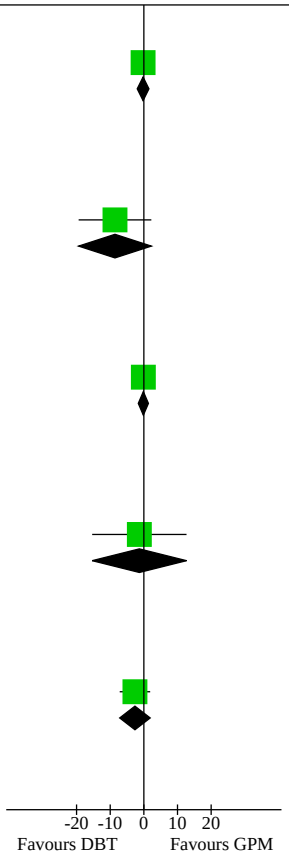


Footnotes

(1) quit treatment

Analysis 21.3. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 3: Standard DBT (DBT) vs good psychiatric management (GPM) (continuous)

Study or Subgroup	DBT Mean	DBT SD	DBT Total	GPM Mean	GPM SD	GPM Total	Weight	Mean Difference IV, Fixed, 95% CI
21.3.1 Primary: BPD severity (continuous), at end of treatment								
McMain 2009 (1)	7.93	6.11	90	8.16	5.79	90	100.0%	-0.23 [-1.97 , 1.51]
Subtotal (95% CI)			**90**			**90**	**100.0%**	**-0.23 [-1.97 , 1.51]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.26 (P = 0.80)								
21.3.2 Primary: self-harm (continuous), at end of treatment								
McMain 2009 (2)	4.29	9.32	90	12.87	51.45	90	100.0%	-8.58 [-19.38 , 2.22]
Subtotal (95% CI)			**90**			**90**	**100.0%**	**-8.58 [-19.38 , 2.22]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.56 (P = 0.12)								
21.3.3 Secondary: anger (continuous), at end of treatment								
McMain 2009 (3)	15.81	5.19	90	15.96	5.11	90	100.0%	-0.15 [-1.65 , 1.35]
Subtotal (95% CI)			**90**			**90**	**100.0%**	**-0.15 [-1.65 , 1.35]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.20 (P = 0.85)								
21.3.4 Secondary: interpersonal problems (continuous), at end of treatment								
McMain 2009 (4)	100.24	50.62	90	101.58	45.19	90	100.0%	-1.34 [-15.36 , 12.68]
Subtotal (95% CI)			**90**			**90**	**100.0%**	**-1.34 [-15.36 , 12.68]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.19 (P = 0.85)								
21.3.5 Secondary: depression (continuous), at end of treatment								
McMain 2009 (5)	22.18	16.14	90	24.83	14.83	90	100.0%	-2.65 [-7.18 , 1.88]
Subtotal (95% CI)			**90**			**90**	**100.0%**	**-2.65 [-7.18 , 1.88]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.15 (P = 0.25)								

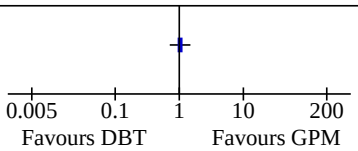


Footnotes

(1) Observer rated: ZAN-BPD
(2) SASII - number of suicidal and self-injurious episodes (CR)
(3) Self reported: STAXI, anger out
(4) Self reported: IIP-C
(5) Self reported: BDI

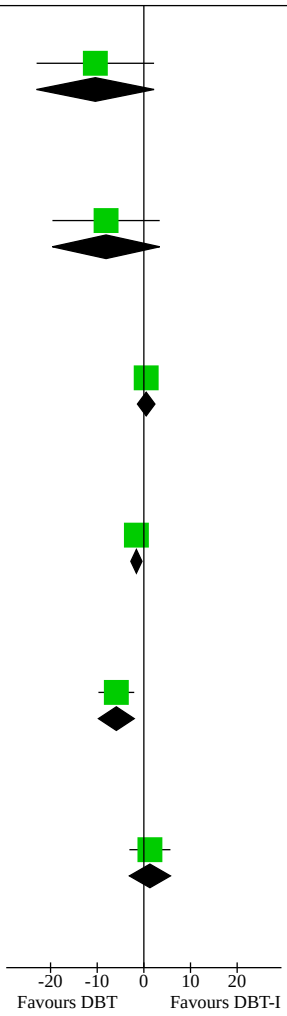
Analysis 21.4. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 4: DBT vs GPM, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	GPM Events	GPM Total	Risk Ratio M-H, Fixed, 95% CI
McMain 2009	35	90	34	90	1.03 [0.71 , 1.49]
Test for subgroup differences: Not applicable					



Analysis 21.5. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 5: Standard DBT (DBT) vs individual DBT therapy + activities group (DBT-I) (continuous)

Study or Subgroup	Standard DBT Mean	SD	Total	DBT-I Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
21.5.1 Primary: self-harm (continuous), at end of treatment								
Linehan 2015a (1)	10.2	16.3	33	20.6	33.1	33	100.0%	-10.40 [-22.99 , 2.19]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-10.40 [-22.99 , 2.19]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.62 (P = 0.11)								
21.5.2 Primary: self-harm (continuous), at 6-12 months follow-up								
Linehan 2015a (1)	7.9	8.5	33	16	32.6	33	100.0%	-8.10 [-19.59 , 3.39]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-8.10 [-19.59 , 3.39]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.38 (P = 0.17)								
21.5.3 Primary: suicide-related outcomes (continuous), at end of treatment								
Linehan 2015a (2)	3.4	4.6	33	2.9	3	33	100.0%	0.50 [-1.37 , 2.37]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**0.50 [-1.37 , 2.37]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.52 (P = 0.60)								
21.5.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up								
Linehan 2015a (2)	2	1.4	33	3.6	3.2	33	100.0%	-1.60 [-2.79 , -0.41]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-1.60 [-2.79 , -0.41]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.63 (P = 0.009)								
21.5.5 Secondary: depression (continuous), at end of treatment								
Linehan 2015a (3)	12.3	8	33	18.2	7.9	33	100.0%	-5.90 [-9.74 , -2.06]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-5.90 [-9.74 , -2.06]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.01 (P = 0.003)								
21.5.6 Secondary: depression (continuous), at 6-12 months follow-up								
Linehan 2015a (3)	15.2	8.6	33	13.9	9.6	33	100.0%	1.30 [-3.10 , 5.70]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**1.30 [-3.10 , 5.70]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.58 (P = 0.56)								

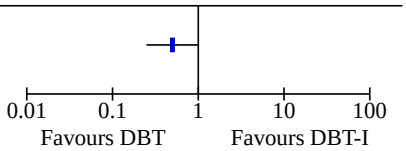


Footnotes

(1) SASII-NASSI (SR)
(2) Number of suicide attempts
(3) Self reported: HRDS

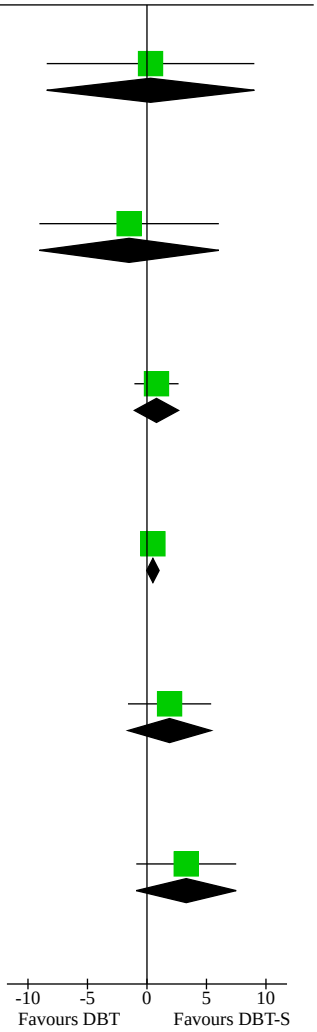
Analysis 21.6. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 6: DBT vs DBT-I, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	DBT-I Events	DBT-I Total	Risk Ratio M-H, Fixed, 95% CI
Linehan 2015a	8	33	16	33	0.50 [0.25 , 1.01]
Test for subgroup differences: Not applicable					



Analysis 21.7. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 7: Standard DBT (DBT) vs skills training group + individual case management (DBT-S) (continuous)

Study or Subgroup	DBT Mean	DBT SD	DBT Total	DBT-S Mean	DBT-S SD	DBT-S Total	Weight	Mean Difference IV, Fixed, 95% CI
21.7.1 Primary: self-harm (continuous), at end of treatment								
Linehan 2015a (1)	10.2	16.3	33	9.9	19.7	33	100.0%	0.30 [-8.42 , 9.02]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**0.30 [-8.42 , 9.02]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.07 (P = 0.95)								
21.7.2 Primary: self-harm (continuous), at 6-12 months follow-up								
Linehan 2015a (1)	7.9	8.5	33	9.4	20.4	33	100.0%	-1.50 [-9.04 , 6.04]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-1.50 [-9.04 , 6.04]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.39 (P = 0.70)								
21.7.3 Primary: suicide-related outcomes (continuous), at end of treatment								
Linehan 2015a (2)	3.4	4.6	33	2.6	2.9	33	100.0%	0.80 [-1.06 , 2.66]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**0.80 [-1.06 , 2.66]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.85 (P = 0.40)								
21.7.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up								
Linehan 2015a (2)	2	1.4	33	1.5	0.6	33	100.0%	0.50 [-0.02 , 1.02]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**0.50 [-0.02 , 1.02]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.89 (P = 0.06)								
21.7.5 Secondary: depression (continuous), at end of treatment								
Linehan 2015a (3)	12.3	8	33	10.4	6.4	33	100.0%	1.90 [-1.60 , 5.40]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**1.90 [-1.60 , 5.40]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.07 (P = 0.29)								
21.7.6 Secondary: depression (continuous), at 6-12 months follow-up								
Linehan 2015a (3)	15.2	8.6	33	11.9	8.8	33	100.0%	3.30 [-0.90 , 7.50]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**3.30 [-0.90 , 7.50]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.54 (P = 0.12)								

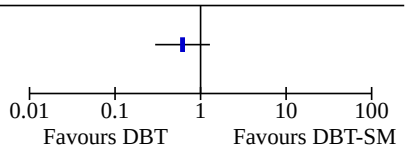


Footnotes

(1) SASII-NASSI (SR)
(2) Number of suicide attempts
(3) Self reported: HRDS

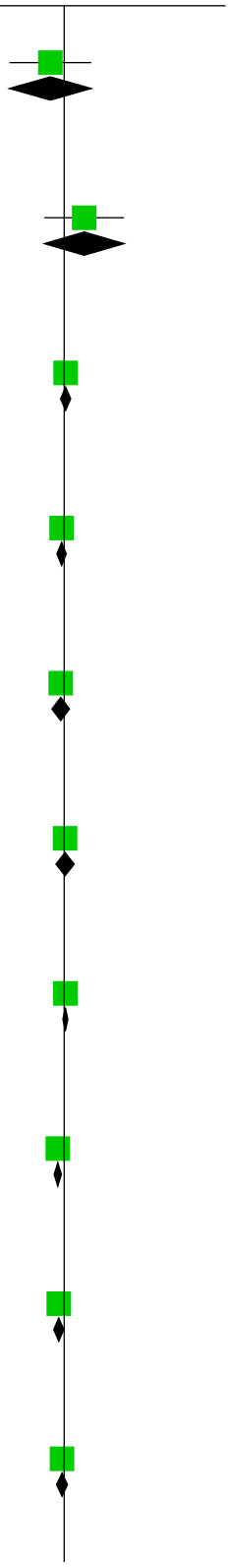
Analysis 21.8. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 8: DBT vs DBT-S, secondary: attrition (dichotomous), at 6-12 months follow-up

Study or Subgroup	DBT Events	DBT Total	DBT-S Events	DBT-S Total	Risk Ratio M-H, Fixed, 95% CI
Linehan 2015a	8	33	13	33	0.62 [0.29 , 1.29]
Test for subgroup differences: Not applicable					



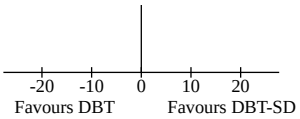
Analysis 21.9. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 9: Standard DBT (DBT) vs step-down DBT (DBT-SD) (continuous)

Study or Subgroup	DBT Mean	DBT SD	DBT Total	DBT-SD Mean	DBT-SD SD	DBT-SD Total	Weight	Mean Difference IV, Fixed, 95% CI
21.9.1 Primary: BPD symptom severity (continuous), at end of treatment								
Sinnaeve 2018 (1)	16.86	13.1332	14	19.69	11.9535	24	100.0%	-2.83 [-11.21 , 5.55]
Subtotal (95% CI)			**14**			**24**	**100.0%**	**-2.83 [-11.21 , 5.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.66 (P = 0.51)								
21.9.2 Primary: self-harm (continuous), at end of treatment								
Sinnaeve 2018 (2)	8.6	14	14	4.5	9	24	100.0%	4.10 [-4.07 , 12.27]
Subtotal (95% CI)			**14**			**24**	**100.0%**	**4.10 [-4.07 , 12.27]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.98 (P = 0.33)								
21.9.3 Primary: suicide-related outcomes (continuous), at end of treatment								
Sinnaeve 2018 (3)	0.5	1.9	14	0.2	0.7	24	100.0%	0.30 [-0.73 , 1.33]
Subtotal (95% CI)			**14**			**24**	**100.0%**	**0.30 [-0.73 , 1.33]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.57 (P = 0.57)								
21.9.4 Secondary: anger (continuous), at end of treatment								
Sinnaeve 2018	1.1664	1.42847	14	1.6915	1.5559	27	100.0%	-0.53 [-1.48 , 0.43]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**-0.53 [-1.48 , 0.43]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.08 (P = 0.28)								
21.9.5 Secondary: affective instability (continuous), at end of treatment								
Sinnaeve 2018	4.0614	2.9328	14	4.7704	2.4972	27	100.0%	-0.71 [-2.51 , 1.09]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**-0.71 [-2.51 , 1.09]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.77 (P = 0.44)								
21.9.6 Secondary: chronic feeling of emptiness (continuous), at end of treatment								
Sinnaeve 2018	3.1071	2.9899	14	2.9259	2.6772	27	100.0%	0.18 [-1.68 , 2.04]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**0.18 [-1.68 , 2.04]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.19 (P = 0.85)								
21.9.7 Secondary: impulsivity (continuous), at end of treatment								
Sinnaeve 2018	1.2871	0.7251	14	1.0422	0.8933	27	100.0%	0.24 [-0.26 , 0.75]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**0.24 [-0.26 , 0.75]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.95 (P = 0.34)								
21.9.8 Secondary: interpersonal problems (continuous), at end of treatment								
Sinnaeve 2018	0.5814	0.6291	14	1.8911	1.745	27	100.0%	-1.31 [-2.05 , -0.57]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**-1.31 [-2.05 , -0.57]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.49 (P = 0.0005)								
21.9.9 Secondary: abandonment (continuous), at end of treatment								
Sinnaeve 2018	0.96929	1.32307	14	2.07963	2.0056	27	100.0%	-1.11 [-2.14 , -0.08]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**-1.11 [-2.14 , -0.08]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.12 (P = 0.03)								
21.9.10 Secondary: dissociation and psychotic-like symptoms (continuous), at end of treatment								
Sinnaeve 2018	1.0014	1.548	14	1.4419	2.0358	27	100.0%	-0.44 [-1.56 , 0.68]
Subtotal (95% CI)			**14**			**27**	**100.0%**	**-0.44 [-1.56 , 0.68]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.77 (P = 0.44)								



Analysis 21.9. (Continued)

Heterogeneity: Not applicable
Test for overall effect: Z = 0.77 (P = 0.44)

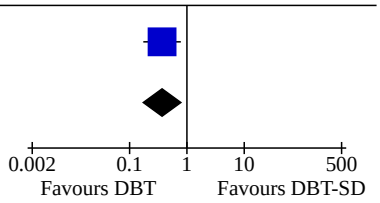


Footnotes
(1) BPDSI-IV total
(2) LPC-NSSI - self-injurious behaviour without suicidal intention
(3) LPC-sui - self-injurious behaviour with suicidal intention

Analysis 21.10. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 10: DBT vs DBT-SD, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	DBT Events	DBT Total	DBT-SD Events	DBT-SD Total	Weight	Risk Ratio M-H, Fixed, 95% CI
Sinnaeve 2018 (1)	7	42	19	42	100.0%	0.37 [0.17 , 0.78]
Total (95% CI)		**42**		**42**	**100.0%**	**0.37 [0.17 , 0.78]**
Total events:	7		19			

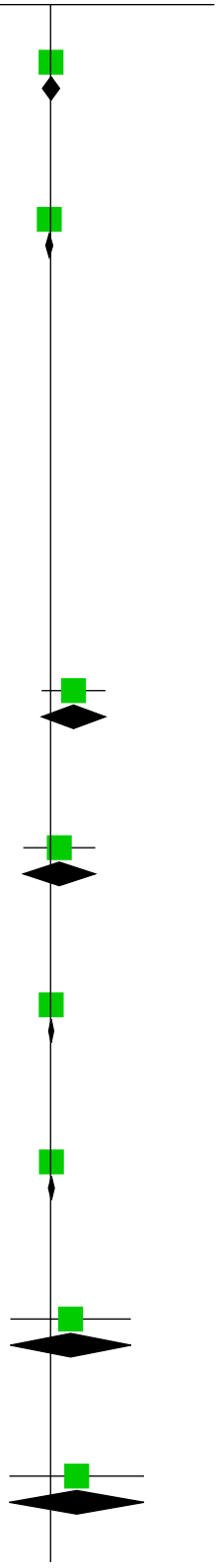
Heterogeneity: Not applicable
Test for overall effect: Z = 2.60 (P = 0.009)
Test for subgroup differences: Not applicable



Footnotes
(1) discontinued intervention

Analysis 21.11. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 11: Standard DBT (DBT) vs DBT Prolonged Exposure (PE) (continuous)

Study or Subgroup	DBT Mean	DBT SD	DBT Total	DBT-PE Mean	DBT-PE SD	DBT-PE Total	Weight	Mean Difference IV, Fixed, 95% CI
21.11.1 Primary: self-harm (continuous), end of treatment								
Harned 2014 (1)	1	2	6	0.9	2	12	100.0%	0.10 [-1.86 , 2.06]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**0.10 [-1.86 , 2.06]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.10 (P = 0.92)								
21.11.2 Primary: self-harm (continuous), at 0-6 months follow-up								
Harned 2014 (2)	0.3	0.5	6	0.6	1.2	12	100.0%	-0.30 [-1.09 , 0.49]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**-0.30 [-1.09 , 0.49]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.75 (P = 0.46)								
21.11.3 Primary: suicide-related outcomes (continuous), end of treatment								
Harned 2014 (3)	0.2	0.4	6	0	0	12		Not estimable
Subtotal (95% CI)			**6**			**12**		**Not estimable**
Heterogeneity: Not applicable								
Test for overall effect: Not applicable								
21.11.4 Primary: suicide-related outcomes (continuous), at 0-6 months follow-up								
Harned 2014 (4)	0	0	6	0.1	0.3	12		Not estimable
Subtotal (95% CI)			**6**			**12**		**Not estimable**
Heterogeneity: Not applicable								
Test for overall effect: Not applicable								
21.11.5 Primary: psychosocial functioning (continuous), end of treatment								
Harned 2014 (5)	-53	5.62	6	-58.27	10.23	12	100.0%	5.27 [-2.06 , 12.60]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**5.27 [-2.06 , 12.60]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.41 (P = 0.16)								
21.11.6 Primary: psychosocial functioning (continuous), at 0-6 months follow-up								
Harned 2014 (5)	-55.4	5.55	6	-57.4	12.33	12	100.0%	2.00 [-6.27 , 10.27]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**2.00 [-6.27 , 10.27]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.47 (P = 0.64)								
21.11.7 Secondary: interpersonal problems (continuous), end of treatment								
Harned 2014 (6)	1.63	0.51	6	1.49	0.67	12	100.0%	0.14 [-0.42 , 0.70]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**0.14 [-0.42 , 0.70]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.49 (P = 0.62)								
21.11.8 Secondary: interpersonal problems (continuous), at 0-6 months follow-up								
Harned 2014 (6)	2.01	0.5	6	1.82	0.94	12	100.0%	0.19 [-0.48 , 0.86]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**0.19 [-0.48 , 0.86]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.56 (P = 0.58)								
21.11.9 Secondary: dissociation or psychotic-like symptoms (continuous), end of treatment								
Harned 2014 (7)	14.6	12.5	6	10	16.9	12	100.0%	4.60 [-9.24 , 18.44]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**4.60 [-9.24 , 18.44]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.65 (P = 0.51)								
21.11.10 Secondary: dissociation or psychotic-like symptoms (continuous), at 0-6 months follow-up								
Harned 2014 (7)	17.3	15.3	6	11.3	16.7	12	100.0%	6.00 [-9.46 , 21.46]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**6.00 [-9.46 , 21.46]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.76 (P = 0.45)								



Analysis 21.11. (Continued)

Heterogeneity: Not applicable
Test for overall effect: Z = 0.76 (P = 0.45)

21.11.11 Secondary: depression (continuous), end of treatment

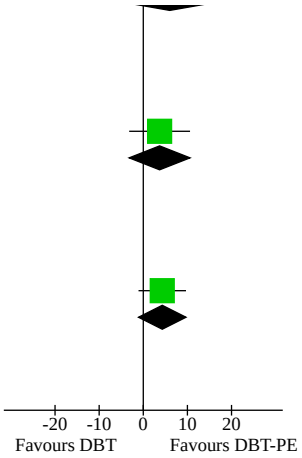
Harned 2014 (8)	15.5	6.5	6	11.8	8	12	100.0%	3.70 [-3.19 , 10.59]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**3.70 [-3.19 , 10.59]**

Heterogeneity: Not applicable
Test for overall effect: Z = 1.05 (P = 0.29)

21.11.12 Secondary: depression (continuous), at 0-6 months follow-up

Harned 2014 (8)	16.8	3.4	6	12.5	8.2	12	100.0%	4.30 [-1.08 , 9.68]
Subtotal (95% CI)			**6**			**12**	**100.0%**	**4.30 [-1.08 , 9.68]**

Heterogeneity: Not applicable
Test for overall effect: Z = 1.57 (P = 0.12)



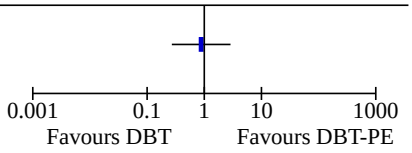
Footnotes

(1) Self reported: SASII-NSSI acts
(2) Self reported: Non-suicidal self-injury scale
(3) Self reported: SASII - suicide attempts
(4) Self reported: SASII
(5) Clinician-rated: GAS
(6) IIP-25 (SR)
(7) Self reported: DES-T
(8) Self reported: HRDS

Analysis 21.12. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 12: DBT vs DBT-PE, secondary: attrition (dichotomous), at 0-6 months follow-up

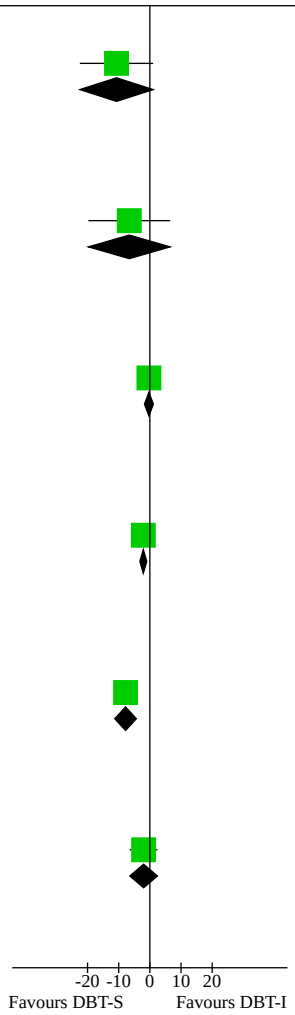
	DBT		DBT-PE		Risk Ratio	Risk Ratio
Study or Subgroup	**Events**	**Total**	**Events**	**Total**	**M-H, Fixed, 95% CI**	**M-H, Fixed, 95% CI**
Harned 2014	5	17	3	9	0.88 [0.27 , 2.88]	

Test for subgroup differences: Not applicable



Analysis 21.13. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 13: DBT skills group + case management (DBT-S) vs DBT individual therapy + activity group (DBT-I) (continuous)

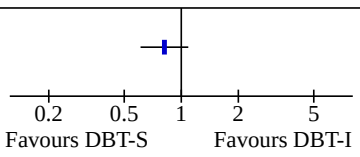
Study or Subgroup	DBT-S Mean	DBT-S SD	DBT-S Total	DBT-I Mean	DBT-I SD	DBT-I Total	Weight	Mean Difference IV, Fixed, 95% CI
21.13.1 Primary: self-harm (continuous), at end of treatment								
Linehan 2015a (1)	9.9	9.7	33	20.6	33.1	33	100.0%	-10.70 [-22.47 , 1.07]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-10.70 [-22.47 , 1.07]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.78 (P = 0.07)								
21.13.2 Primary: self-harming behaviour (continuous), at 6-12 months follow-up								
Linehan 2015a (1)	9.4	20.4	33	16	32.6	33	100.0%	-6.60 [-19.72 , 6.52]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-6.60 [-19.72 , 6.52]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.99 (P = 0.32)								
21.13.3 Primary: suicide-related outcomes (continuous), at end of treatment								
Linehan 2015a (2)	2.6	2.9	33	2.9	3	33	100.0%	-0.30 [-1.72 , 1.12]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-0.30 [-1.72 , 1.12]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.41 (P = 0.68)								
21.13.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up								
Linehan 2015a (2)	1.5	0.6	33	3.6	3.2	33	100.0%	-2.10 [-3.21 , -0.99]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-2.10 [-3.21 , -0.99]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.71 (P = 0.0002)								
21.13.5 Secondary: depression (continuous), at end of treatment								
Linehan 2015a (3)	10.4	6.4	33	18.2	7.9	33	100.0%	-7.80 [-11.27 , -4.33]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-7.80 [-11.27 , -4.33]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 4.41 (P < 0.0001)								
21.13.6 Secondary: depression (continuous), at 6-12 months follow-up								
Linehan 2015a (3)	11.9	8.8	33	13.9	9.6	33	100.0%	-2.00 [-6.44 , 2.44]
Subtotal (95% CI)			**33**			**33**	**100.0%**	**-2.00 [-6.44 , 2.44]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.88 (P = 0.38)								



Footnotes
(1) SASII-NASSI (SR)
(2) mean number of suicide attempts
(3) Self rated: HRDS

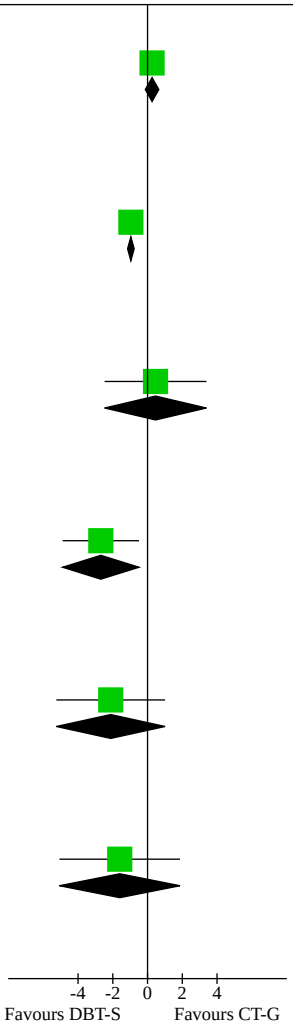
Analysis 21.14. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 14: DBT-S vs DBT-I, secondary: attrition (dichotomous), at 6-12 months follow-up

Study or Subgroup	DBT-S Events	DBT-S Total	DBT-I Events	DBT-I Total	Risk Ratio M-H, Fixed, 95% CI
Linehan 2015a	22	33	27	33	0.81 [0.61 , 1.09]
Test for subgroup differences: Not applicable					



Analysis 21.15. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 15: DBT skills group (DBT-S) vs cognitive therapy group (CT-G) (continuous)

Study or Subgroup	DBT-S Mean	DBT-S SD	DBT-S Total	CT-G Mean	CT-G SD	CT-G Total	Weight	Mean Difference IV, Fixed, 95% CI
21.15.1 Primary: BPD symptom severity (continuous), at end of treatment								
Lin 2019 (1)	6	0.98	42	5.74	0.81	40	100.0%	0.26 [-0.13 , 0.65]
Subtotal (95% CI)			**42**			**40**	**100.0%**	**0.26 [-0.13 , 0.65]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.31 (P = 0.19)								
21.15.2 Primary: BPD symptom severity (continuous), at 0-6 months follow-up								
Lin 2019 (1)	4.91	0.6	42	5.87	0.18	40	100.0%	-0.96 [-1.15 , -0.77]
Subtotal (95% CI)			**42**			**40**	**100.0%**	**-0.96 [-1.15 , -0.77]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 9.91 (P < 0.00001)								
21.15.3 Primary: suicide-related outcomes (continuous), at end of treatment								
Lin 2019 (2)	49	6.5	42	48.54	7.01	40	100.0%	0.46 [-2.47 , 3.39]
Subtotal (95% CI)			**42**			**40**	**100.0%**	**0.46 [-2.47 , 3.39]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.31 (P = 0.76)								
21.15.4 Primary: suicide-related outcomes (continuous), at 0-6 months follow-up								
Lin 2019 (2)	40.27	4.91	42	42.96	5.23	40	100.0%	-2.69 [-4.89 , -0.49]
Subtotal (95% CI)			**42**			**40**	**100.0%**	**-2.69 [-4.89 , -0.49]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.40 (P = 0.02)								
21.15.5 Secondary: depression (continuous), at end of treatment								
Lin 2019 (3)	17.08	6.02	42	19.2	8.21	40	100.0%	-2.12 [-5.25 , 1.01]
Subtotal (95% CI)			**42**			**40**	**100.0%**	**-2.12 [-5.25 , 1.01]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.33 (P = 0.18)								
21.15.6 Secondary: depression (continuous), at 0-6 months follow-up								
Lin 2019 (3)	21.73	8.38	42	23.33	7.65	40	100.0%	-1.60 [-5.07 , 1.87]
Subtotal (95% CI)			**42**			**40**	**100.0%**	**-1.60 [-5.07 , 1.87]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.90 (P = 0.37)								

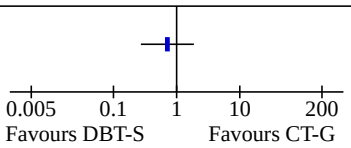


Footnotes
(1) BPDFS
(2) ASIQ-S
(3) Ko's Depression Inventory

Analysis 21.16. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 16: DBT-S vs CT-G, secondary: attrition (dichotomous), at end of treatment

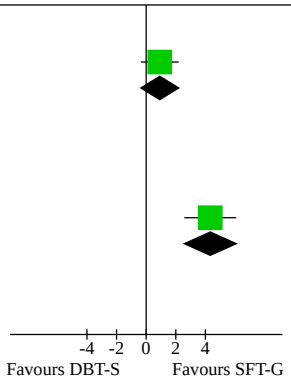
Study or Subgroup	DBT-S Events	DBT-S Total	CT-G Events	CT-G Total	Risk Ratio M-H, Random, 95% CI
Lin 2019	6	42	8	40	0.71 [0.27 , 1.88]

Test for subgroup differences: Not applicable



Analysis 21.17. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 17: DBT skills group (DBT-S) vs schema-focused therapy group (SFT-G)

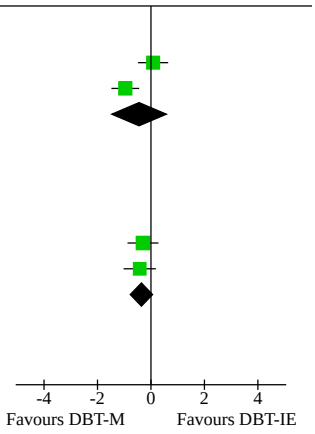
Study or Subgroup	DBT-S Mean	DBT-S SD	DBT-S Total	SFT-G Mean	SFT-G SD	SFT-G Total	Weight	Mean Difference IV, Random, 95% CI
21.17.1 Primary: suicide-related outcomes (continuous), at end of treatment								
Mohamadizadeh 2017 (1)	15.25	1.65	12	14.33	1.55	12	100.0%	0.92 [-0.36 , 2.20]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**0.92 [-0.36 , 2.20]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.41 (P = 0.16)								
21.17.2 Secondary: depression (continuous), at end of treatment								
Mohamadizadeh 2017 (2)	24.16	2.7	12	19.83	1.53	12	100.0%	4.33 [2.57 , 6.09]
Subtotal (95% CI)			**12**			**12**	**100.0%**	**4.33 [2.57 , 6.09]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 4.83 (P < 0.00001)								



Footnotes
(1) Self rated: BSS
(2) Self rated: BDI

Analysis 21.18. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 18: DBT mindfulness group (DBT-M) vs DBT interpersonal effectiveness group (DBT-IE) (continuous)

Study or Subgroup	DBT-M Mean	DBT-M SD	DBT-M Total	DBT-IE Mean	DBT-IE SD	DBT-IE Total	Weight	Std. Mean Difference IV, Random, 95% CI
21.18.1 Primary: BPD symptom severity (continuous), at end of treatment								
Carmona í Farrés 2019 (1)	43.77	26.3	22	41.77	22.3	27	49.4%	0.08 [-0.48 , 0.64]
Elices 2016 (1)	33.46	20.97	32	52.5	18.1	32	50.6%	-0.96 [-1.48 , -0.44]
Subtotal (95% CI)			**54**			**59**	**100.0%**	**-0.45 [-1.47 , 0.58]**
Heterogeneity: Tau² = 0.47; Chi² = 7.10, df = 1 (P = 0.008); I² = 86%								
Test for overall effect: Z = 0.86 (P = 0.39)								
21.18.2 Secondary: impulsivity (continuous), at end of treatment								
Carmona í Farrés 2019 (2)	27.38	3.85	21	28.92	5.87	26	52.1%	-0.30 [-0.88 , 0.28]
Elices 2016 (3)	21.05	5.83	19	23.48	5.56	25	47.9%	-0.42 [-1.02 , 0.18]
Subtotal (95% CI)			**40**			**51**	**100.0%**	**-0.36 [-0.77 , 0.06]**
Heterogeneity: Tau² = 0.00; Chi² = 0.08, df = 1 (P = 0.78); I² = 0%								
Test for overall effect: Z = 1.67 (P = 0.09)								

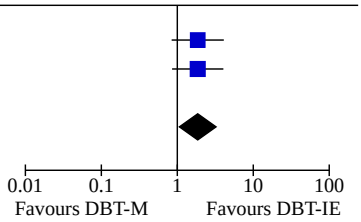


Footnotes
(1) Self rated: BSL-23
(2) BIS-11 - non planning
(3) BIS-11 - non-planning

Analysis 21.19. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 19: DBT-M vs DBT-IE, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	DBT-M Events	DBT-M Total	DBT-IE Events	DBT-IE Total	Weight	Risk Ratio M-H, Random, 95% CI
Carmona í Farrés 2019	13	35	7	35	49.2%	1.86 [0.84 , 4.09]
Elices 2016	13	32	7	32	50.8%	1.86 [0.85 , 4.04]
Total (95% CI)		**67**		**67**	**100.0%**	**1.86 [1.07 , 3.23]**
Total events:	26		14			

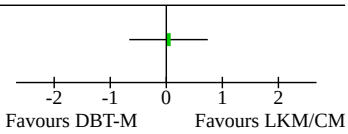
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 1.00); I² = 0%
Test for overall effect: Z = 2.19 (P = 0.03)
Test for subgroup differences: Not applicable



Analysis 21.20. Comparison 21: Dialectical behavior therapy (DBT) and related treatments vs active treatment, Outcome 20: DBT mindfulness group (DBT-M) vs loving-kindness and compassion meditation (LK/CM), primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	DBT-M Mean	DBT-M SD	DBT-M Total	LKM/CM Mean	LKM/CM SD	LKM/CM Total	Mean Difference IV, Fixed, 95% CI
Feliu-Soler 2017 (1)	1.39	1.02	16	1.35	1	16	0.04 [-0.66 , 0.74]

Test for subgroup differences: Not applicable



Footnotes
(1) Self rated: BSL

Comparison 22. Cognitive behavioural therapy (CBT) and related treatments vs active treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
22.1 CBT vs trauma- and anxiety-related group psychoeducation (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
22.1.1 Primary: BPD symptom severity (continuous), at end of treatment	1	50	Mean Difference (IV, Fixed, 95% CI)	-0.26 [-1.46, 0.94]
22.1.2 Primary: BPD symptom severity (continuous), at 0-6 months follow-up	1	50	Mean Difference (IV, Fixed, 95% CI)	-0.39 [-1.60, 0.82]
22.1.3 Primary: BPD symptom severity (continuous), at 6-12 months follow-up	1	50	Mean Difference (IV, Fixed, 95% CI)	0.57 [-0.48, 1.62]
22.1.4 Primary: psychosocial functioning (continuous), at end of treatment	1	50	Mean Difference (IV, Fixed, 95% CI)	-0.64 [-5.76, 4.48]
22.1.5 Primary: psychosocial functioning (continuous), at 0-6 months follow-up	1	50	Mean Difference (IV, Fixed, 95% CI)	-1.23 [-6.94, 4.48]
22.1.6 Primary: psychosocial functioning (continuous), at 6-12 months follow-up	1	50	Mean Difference (IV, Fixed, 95% CI)	0.61 [-5.00, 6.22]

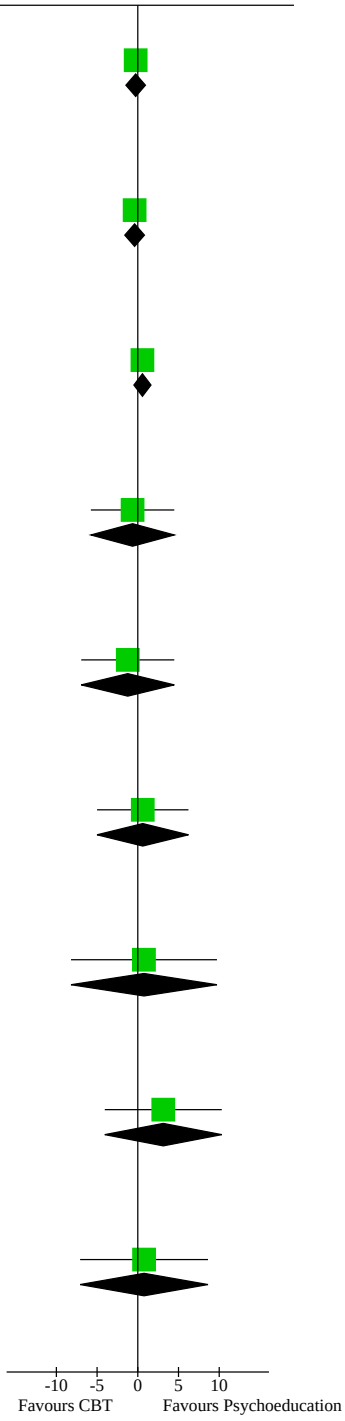
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
22.1.7 Secondary: depression (continuous), at end of treatment	1	50	Mean Difference (IV, Fixed, 95% CI)	0.76 [-8.20, 9.72]
22.1.8 Secondary: depression (continuous), at 0-6 months follow-up	1	50	Mean Difference (IV, Fixed, 95% CI)	3.13 [-4.05, 10.31]
22.1.9 Secondary: depression (continuous), at 6-12 months follow-up	1	50	Mean Difference (IV, Fixed, 95% CI)	0.77 [-7.08, 8.62]
22.2 CBT vs trauma- and anxiety-related group psychoeducation, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
22.3 CBT vs interpersonal psychotherapy (IPT) (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
22.3.1 Primary: psychosocial functioning (continuous), at end of treatment	1	26	Mean Difference (IV, Fixed, 95% CI)	-5.30 [-12.36, 1.76]
22.3.2 Secondary: depression (continuous), at end of treatment	1	26	Mean Difference (IV, Fixed, 95% CI)	-0.40 [-4.72, 3.92]
22.4 CBT vs IPT, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
22.5 CBT vs Rogerian supportive therapy (continuous)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
22.5.1 Primary: self-harm (continuous), end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	0.74 [-0.03, 1.51]
22.5.2 Primary: self-harm (continuous), at 6-12 months follow-up	1	21	Mean Difference (IV, Fixed, 95% CI)	-0.63 [-1.75, 0.49]
22.5.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	0.69 [-2.60, 3.98]
22.5.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up	1	21	Mean Difference (IV, Fixed, 95% CI)	-2.43 [-6.14, 1.28]
22.5.5 Primary: psychosocial functioning (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	-0.43 [-1.31, 0.45]
22.5.6 Primary: psychosocial functioning (continuous), at 6-12 months follow-up	1	21	Mean Difference (IV, Fixed, 95% CI)	-0.98 [-2.02, 0.06]
22.5.7 Secondary: impulsivity (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	-1.01 [-3.85, 1.83]
22.5.8 Secondary: impulsivity (continuous), at 6-12 months follow-up	1	21	Mean Difference (IV, Fixed, 95% CI)	-2.18 [-5.91, 1.55]
22.5.9 Secondary: depression (continuous), at end of treatment	1	38	Mean Difference (IV, Fixed, 95% CI)	1.04 [-5.59, 7.67]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
22.5.10 Secondary: depression (continuous), at 6-12 months follow-up	1	21	Mean Difference (IV, Fixed, 95% CI)	-5.15 [-9.38, -0.92]
22.6 CBT vs Rogerian supportive therapy, secondary: attrition (dichotomous), end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
22.7 MACT (Manual-assisted Cognitive Therapy) vs MACT + therapeutic assessment (MACT + TA) (continuous)	1		Mean Difference (IV, Random, 95% CI)	Subtotals only
22.7.1 Primary: BPD symptom severity (continuous), at end of treatment	1	16	Mean Difference (IV, Random, 95% CI)	-3.75 [-14.17, 6.67]
22.7.2 Primary: self-harm (continuous), at end of treatment	1	16	Mean Difference (IV, Random, 95% CI)	1.75 [-18.71, 22.21]
22.7.3 Primary: suicide-related outcomes (continuous), at end of treatment	1	16	Mean Difference (IV, Random, 95% CI)	-0.63 [-17.71, 16.45]
22.7.4 Secondary: affective instability (continuous), at end of treatment	1	16	Mean Difference (IV, Random, 95% CI)	-5.25 [-12.10, 1.60]
22.7.5 Secondary: interpersonal problems (continuous), at end of treatment	1	16	Mean Difference (IV, Random, 95% CI)	-0.50 [-11.24, 10.24]
22.7.6 Secondary: identity disturbance (continuous), at end of treatment	1	16	Mean Difference (IV, Random, 95% CI)	-4.88 [-14.98, 5.22]
22.8 MACT vs MACT + TA, secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
22.9 Meta-Cognitive training for BPD (B-MCT) vs progressive muscle relaxation training (PMR)	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
22.9.1 Primary: BPD symptom severity (continuous), at end of treatment	1	49	Mean Difference (IV, Fixed, 95% CI)	-1.80 [-4.97, 1.37]
22.9.2 Primary: BPD symptom severity (continuous), at 0-6 months follow up	1	39	Mean Difference (IV, Fixed, 95% CI)	-3.60 [-7.16, -0.04]
22.9.3 Secondary: depression (continuous), at end of treatment	1	54	Mean Difference (IV, Fixed, 95% CI)	-3.20 [-9.91, 3.51]
22.9.4 Secondary: depression (continuous), at 0-6 months follow-up	1	47	Mean Difference (IV, Fixed, 95% CI)	8.50 [2.03, 14.97]
22.10 B-MCT vs progressive muscle relaxation (PMR) training + TAU (dichotomous). Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
22.11 MOTR (Motive-Oriented Therapeutic Relationship) vs Good Psychiatric Management (GPM) (continuous)	2		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
22.11.1 Primary: BPD symptom severity (continuous), at end of treatment	1	74	Std. Mean Difference (IV, Random, 95% CI)	0.07 [-0.39, 0.53]
22.11.2 Primary: psychosocial functioning (continuous), at end of treatment	2	99	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-0.85, -0.05]
22.11.3 Secondary: interpersonal problems (continuous), at end of treatment	2	99	Std. Mean Difference (IV, Random, 95% CI)	-0.56 [-0.97, -0.16]
22.12 MOTR vs (GPM), secondary: attrition (dichotomous), at end of treatment	2	110	Risk Ratio (M-H, Random, 95% CI)	0.61 [0.26, 1.41]

Analysis 22.1. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 1: CBT vs trauma- and anxiety-related group psychoeducation (continuous)

Study or Subgroup	CBT Mean	CBT SD	CBT Total	Psychoeducation Mean	Psychoeducation SD	Psychoeducation Total	Weight	Mean Difference IV, Fixed, 95% CI
22.1.1 Primary: BPD symptom severity (continuous), at end of treatment								
Kredlow 2017b (1)	3.32	1.7	27	3.58	2.48	23	100.0%	-0.26 [-1.46 , 0.94]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**-0.26 [-1.46 , 0.94]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.42 (P = 0.67)								
22.1.2 Primary: BPD symptom severity (continuous), at 0-6 months follow-up								
Kredlow 2017b (2)	3.42	2.17	27	3.81	2.17	23	100.0%	-0.39 [-1.60 , 0.82]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**-0.39 [-1.60 , 0.82]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.63 (P = 0.53)								
22.1.3 Primary: BPD symptom severity (continuous), at 6-12 months follow-up								
Kredlow 2017b (2)	3.24	1.54	27	2.67	2.14	23	100.0%	0.57 [-0.48 , 1.62]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**0.57 [-0.48 , 1.62]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.06 (P = 0.29)								
22.1.4 Primary: psychosocial functioning (continuous), at end of treatment								
Kredlow 2017b (3)	-53.36	8.28	27	-52.72	9.94	23	100.0%	-0.64 [-5.76 , 4.48]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**-0.64 [-5.76 , 4.48]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.24 (P = 0.81)								
22.1.5 Primary: psychosocial functioning (continuous), at 0-6 months follow-up								
Kredlow 2017b (4)	-50.04	9.7	27	-48.81	10.74	23	100.0%	-1.23 [-6.94 , 4.48]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**-1.23 [-6.94 , 4.48]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.42 (P = 0.67)								
22.1.6 Primary: psychosocial functioning (continuous), at 6-12 months follow-up								
Kredlow 2017b (4)	-53.04	8.1	27	-53.65	11.52	23	100.0%	0.61 [-5.00 , 6.22]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**0.61 [-5.00 , 6.22]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.21 (P = 0.83)								
22.1.7 Secondary: depression (continuous), at end of treatment								
Kredlow 2017b (5)	31.2	14.49	27	30.44	17.38	23	100.0%	0.76 [-8.20 , 9.72]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**0.76 [-8.20 , 9.72]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.17 (P = 0.87)								
22.1.8 Secondary: depression (continuous), at 0-6 months follow-up								
Kredlow 2017b (5)	32.38	12.64	27	29.25	13.15	23	100.0%	3.13 [-4.05 , 10.31]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**3.13 [-4.05 , 10.31]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.85 (P = 0.39)								
22.1.9 Secondary: depression (continuous), at 6-12 months follow-up								
Kredlow 2017b (5)	26.6	14.63	27	25.83	13.67	23	100.0%	0.77 [-7.08 , 8.62]
Subtotal (95% CI)			**27**			**23**	**100.0%**	**0.77 [-7.08 , 8.62]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.19 (P = 0.85)								

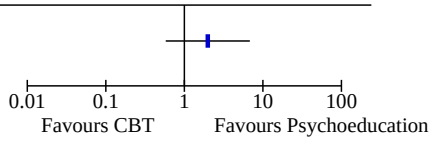


Footnotes

(1) Clinician rated: SCID-BPD
(2) Clinician rated: ZAN-BPD
(3) Clinician rated: GAF
(4) Clinician rated: SDS
(5) Clinician rated: BDI-II

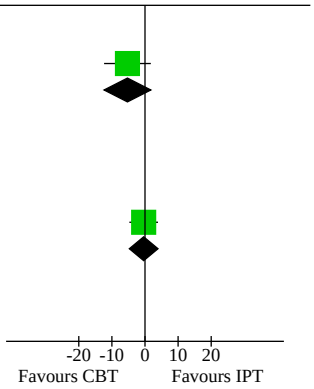
Analysis 22.2. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 2: CBT vs trauma- and anxiety-related group psychoeducation, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	CBT Events	CBT Total	Psychoeducation Events	Psychoeducation Total	Risk Ratio M-H, Fixed, 95% CI
Kredlow 2017b	7	27	3	23	1.99 [0.58 , 6.82]
Test for subgroup differences: Not applicable					



Analysis 22.3. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 3: CBT vs interpersonal psychotherapy (IPT) (continuous)

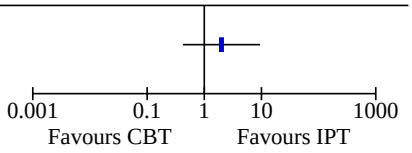
Study or Subgroup	CBT Mean	CBT SD	CBT Total	IPT Mean	IPT SD	IPT Total	Weight	Mean Difference IV, Fixed, 95% CI
22.3.1 Primary: psychosocial functioning (continuous), at end of treatment								
Bellino 2007 (1)	-70.3	9.6	12	-65	8.6	14	100.0%	-5.30 [-12.36 , 1.76]
Subtotal (95% CI)			**12**			**14**	**100.0%**	**-5.30 [-12.36 , 1.76]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.47 (P = 0.14)								
22.3.2 Secondary: depression (continuous), at end of treatment								
Bellino 2007 (2)	13.7	5.7	12	14.1	5.5	14	100.0%	-0.40 [-4.72 , 3.92]
Subtotal (95% CI)			**12**			**14**	**100.0%**	**-0.40 [-4.72 , 3.92]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.18 (P = 0.86)								



Footnotes
(1) Clinician rated: SOFAS
(2) Clinician rated: Ham-D

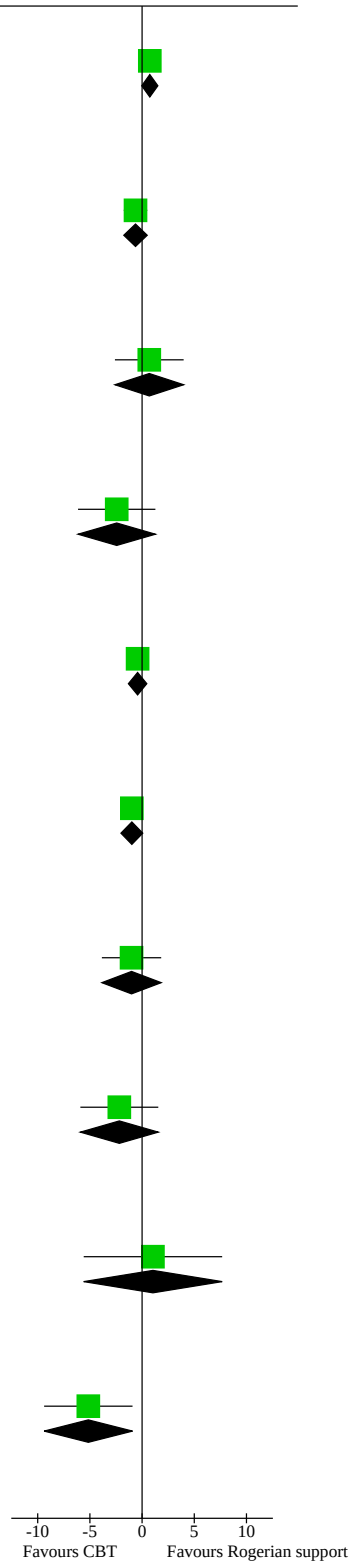
Analysis 22.4. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 4: CBT vs IPT, secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	CBT Events	CBT Total	IPT Events	IPT Total	Risk Ratio M-H, Fixed, 95% CI
Bellino 2007	4	16	2	16	2.00 [0.42 , 9.42]
Test for subgroup differences: Not applicable					



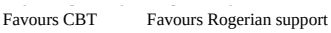
Analysis 22.5. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 5: CBT vs Rogerian supportive therapy (continuous)

Study or Subgroup	CBT Mean	CBT SD	CBT Total	Rogerian support Mean	Rogerian support SD	Rogerian support Total	Weight	Mean Difference IV, Fixed, 95% CI
22.5.1 Primary: self-harm (continuous), end of treatment								
Cottraux 2009 (1)	1.8	1.36	20	1.06	1.06	18	100.0%	0.74 [-0.03 , 1.51]
Subtotal (95% CI)			**20**			**18**	**100.0%**	**0.74 [-0.03 , 1.51]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.88 (P = 0.06)								
22.5.2 Primary: self-harm (continuous), at 6-12 months follow-up								
Cottraux 2009 (1)	0.73	1.19	10	1.36	1.43	11	100.0%	-0.63 [-1.75 , 0.49]
Subtotal (95% CI)			**10**			**11**	**100.0%**	**-0.63 [-1.75 , 0.49]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.10 (P = 0.27)								
22.5.3 Primary: suicide-related outcomes (continuous), at end of treatment								
Cottraux 2009 (2)	7.25	5.37	20	6.56	4.98	18	100.0%	0.69 [-2.60 , 3.98]
Subtotal (95% CI)			**20**			**18**	**100.0%**	**0.69 [-2.60 , 3.98]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.41 (P = 0.68)								
22.5.4 Primary: suicide-related outcomes (continuous), at 6-12 months follow-up								
Cottraux 2009 (2)	5.3	3.8	10	7.73	4.84	11	100.0%	-2.43 [-6.14 , 1.28]
Subtotal (95% CI)			**10**			**11**	**100.0%**	**-2.43 [-6.14 , 1.28]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.29 (P = 0.20)								
22.5.5 Primary: psychosocial functioning (continuous), at end of treatment								
Cottraux 2009 (3)	3.35	1.42	20	3.78	1.35	18	100.0%	-0.43 [-1.31 , 0.45]
Subtotal (95% CI)			**20**			**18**	**100.0%**	**-0.43 [-1.31 , 0.45]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.96 (P = 0.34)								
22.5.6 Primary: psychosocial functioning (continuous), at 6-12 months follow-up								
Cottraux 2009 (3)	2.2	1.03	10	3.18	1.4	11	100.0%	-0.98 [-2.02 , 0.06]
Subtotal (95% CI)			**10**			**11**	**100.0%**	**-0.98 [-2.02 , 0.06]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.84 (P = 0.07)								
22.5.7 Secondary: impulsivity (continuous), at end of treatment								
Cottraux 2009 (4)	7.6	3.82	20	8.61	4.97	18	100.0%	-1.01 [-3.85 , 1.83]
Subtotal (95% CI)			**20**			**18**	**100.0%**	**-1.01 [-3.85 , 1.83]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.70 (P = 0.49)								
22.5.8 Secondary: impulsivity (continuous), at 6-12 months follow-up								
Cottraux 2009 (4)	4.55	4.66	10	6.73	4	11	100.0%	-2.18 [-5.91 , 1.55]
Subtotal (95% CI)			**10**			**11**	**100.0%**	**-2.18 [-5.91 , 1.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.14 (P = 0.25)								
22.5.9 Secondary: depression (continuous), at end of treatment								
Cottraux 2009 (5)	13.6	11.29	20	12.56	9.56	18	100.0%	1.04 [-5.59 , 7.67]
Subtotal (95% CI)			**20**			**18**	**100.0%**	**1.04 [-5.59 , 7.67]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.31 (P = 0.76)								
22.5.10 Secondary: depression (continuous), at 6-12 months follow-up								
Cottraux 2009 (5)	6.4	4.48	10	11.55	5.41	11	100.0%	-5.15 [-9.38 , -0.92]
Subtotal (95% CI)			**10**			**11**	**100.0%**	**-5.15 [-9.38 , -0.92]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.38 (P = 0.02)								



Footnotes
(1) SHBCL (CR)

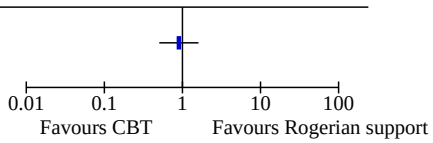
Analysis 22.5. (Continued)



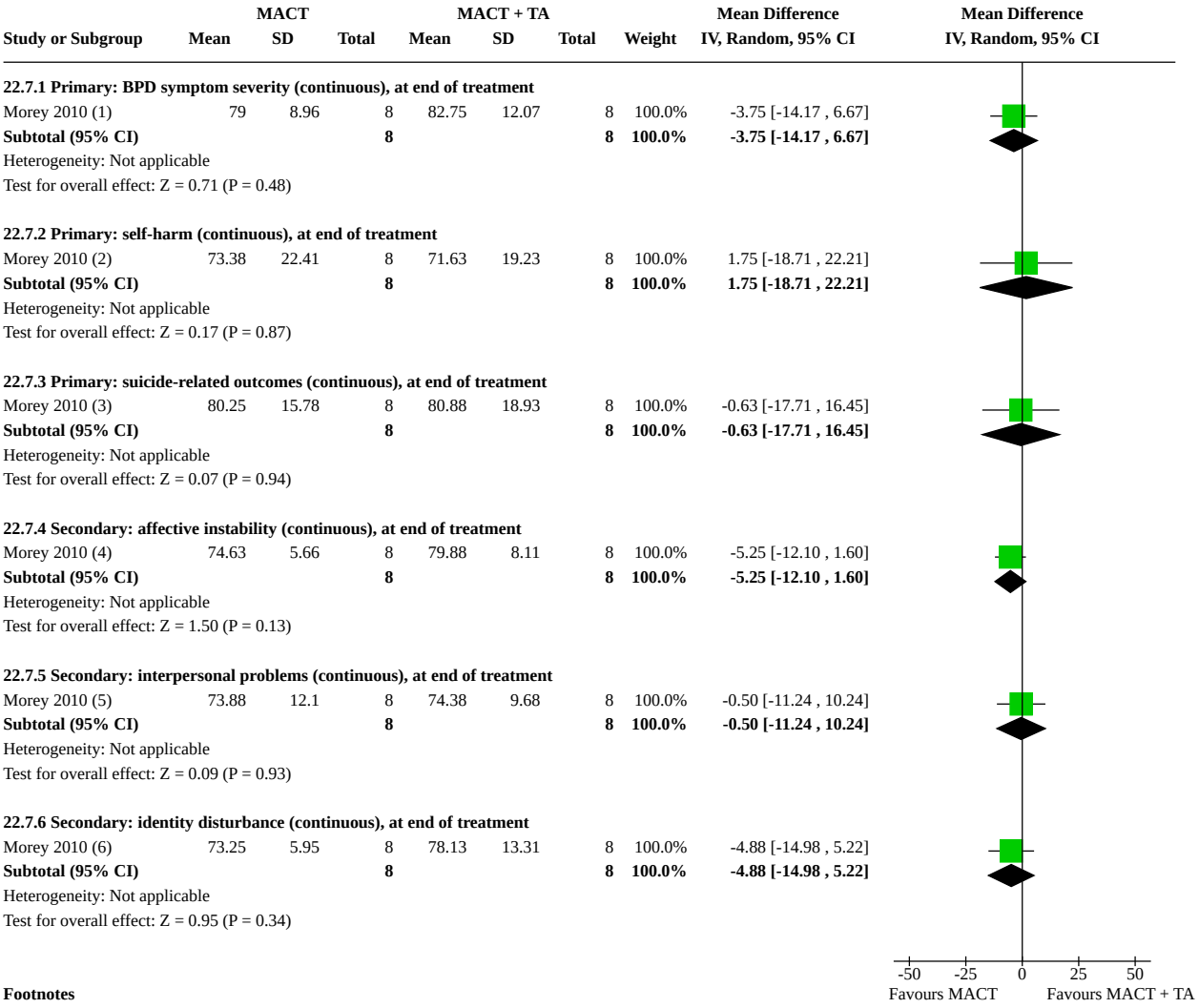
Footnotes
(1) SHBCL (CR)
(2) BHS (SR)
(3) CGI-S (CR)
(4) IVE-impulsivity (SR)
(5) BDI (SR)

Analysis 22.6. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 6: CBT vs Rogerian supportive therapy, secondary: attrition (dichotomous), end of treatment

	CBT		Rogerian support		Risk Ratio	Risk Ratio
Study or Subgroup	**Events**	**Total**	**Events**	**Total**	**M-H, Fixed, 95% CI**	**M-H, Fixed, 95% CI**
Cottraux 2009	13	33	14	32	0.90 [0.51 , 1.60]	
Test for subgroup differences: Not applicable						



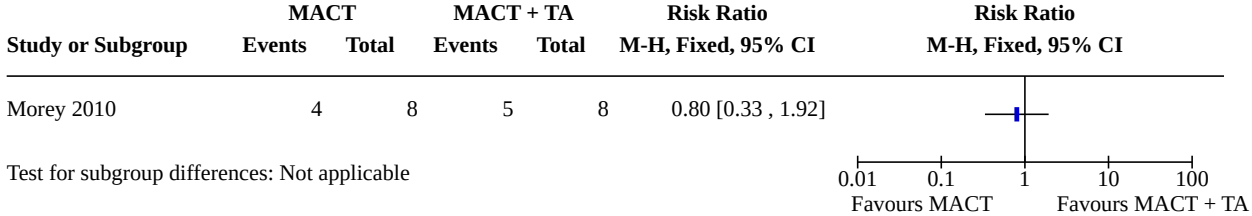
Analysis 22.7. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 7: MACT (Manual-assisted Cognitive Therapy) vs MACT + therapeutic assessment (MACT + TA) (continuous)



Footnotes

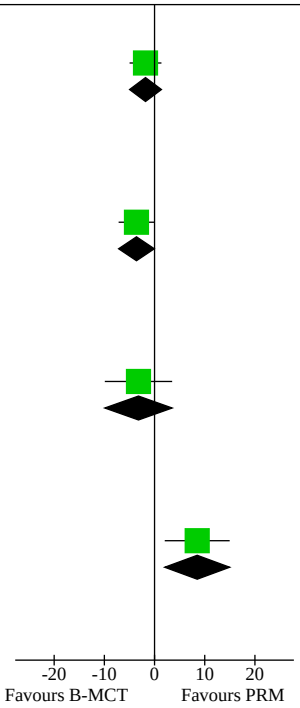
(1) Personality Assessment Inventory (PAI)-BOR-total
(2) PAI-BOR-S
(3) PAI-SI
(4) PAI-BOR-A
(5) PAI-BOR-N
(6) PAI-BOR-I

Analysis 22.8. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 8: MACT vs MACT + TA, secondary: attrition (dichotomous), at end of treatment



Analysis 22.9. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 9: Meta-Cognitive training for BPD (B-MCT) vs progressive muscle relaxation training (PMR)

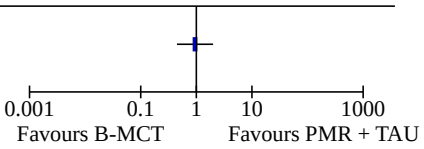
Study or Subgroup	B-MCT Mean	B-MCT SD	B-MCT Total	PMR Mean	PMR SD	PMR Total	Weight	Mean Difference IV, Fixed, 95% CI
22.9.1 Primary: BPD symptom severity (continuous), at end of treatment								
Schilling 2018 (1)	7.9	5.1	24	9.7	6.2	25	100.0%	-1.80 [-4.97 , 1.37]
Subtotal (95% CI)			**24**			**25**	**100.0%**	**-1.80 [-4.97 , 1.37]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.11 (P = 0.27)								
22.9.2 Primary: BPD symptom severity (continuous), at 0-6 months follow up								
Schilling 2018 (1)	7.8	6	16	11.4	4.9	23	100.0%	-3.60 [-7.16 , -0.04]
Subtotal (95% CI)			**16**			**23**	**100.0%**	**-3.60 [-7.16 , -0.04]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.98 (P = 0.05)								
22.9.3 Secondary: depression (continuous), at end of treatment								
Schilling 2018 (2)	19.6	12.2	28	22.8	12.9	26	100.0%	-3.20 [-9.91 , 3.51]
Subtotal (95% CI)			**28**			**26**	**100.0%**	**-3.20 [-9.91 , 3.51]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.93 (P = 0.35)								
22.9.4 Secondary: depression (continuous), at 0-6 months follow-up								
Schilling 2018 (2)	13.9	11.1	22	5.4	11.5	25	100.0%	8.50 [2.03 , 14.97]
Subtotal (95% CI)			**22**			**25**	**100.0%**	**8.50 [2.03 , 14.97]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.58 (P = 0.01)								



Footnotes
(1) Clinician rated: BSL
(2) Self rated: BDI

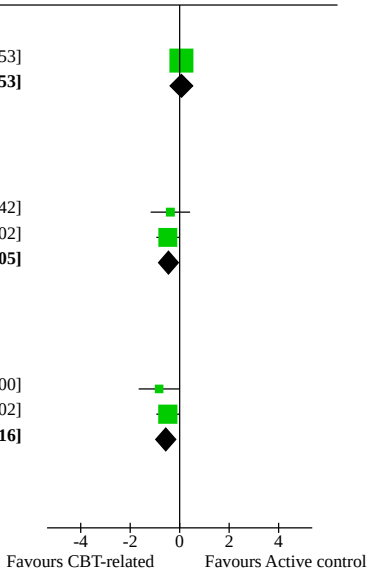
Analysis 22.10. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 10: B-MCT vs progressive muscle relaxation (PMR) training + TAU (dichotomous). Secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	B-MCT Events	B-MCT Total	PMR + TAU Events	PMR + TAU Total	Risk Ratio M-H, Fixed, 95% CI
Schilling 2018	10	38	10	36	0.95 [0.45 , 2.00]
Test for subgroup differences: Not applicable					



Analysis 22.11. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 11: MOTR (Motive-Oriented Therapeutic Relationship) vs Good Psychiatric Management (GPM) (continuous)

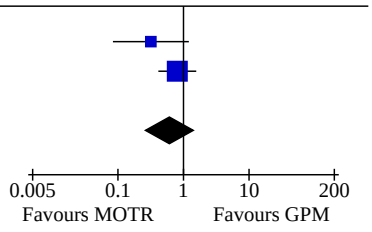
Study or Subgroup	MOTR Mean	MOTR SD	MOTR Total	GPM Mean	GPM SD	GPM Total	Weight	Std. Mean Difference IV, Random, 95% CI
22.11.1 Primary: BPD symptom severity (continuous), at end of treatment								
Kramer 2014 (1)	1.58	0.99	36	1.51	0.97	38	100.0%	0.07 [-0.39 , 0.53]
Subtotal (95% CI)			**36**			**38**	**100.0%**	**0.07 [-0.39 , 0.53]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.30 (P = 0.76)								
22.11.2 Primary: psychosocial functioning (continuous), at end of treatment								
Kramer 2011 (2)	-1.81	3.93	11	-0.43	3.23	14	25.2%	-0.38 [-1.17 , 0.42]
Kramer 2014 (2)	11.97	6.41	36	14.97	5.98	38	74.8%	-0.48 [-0.94 , -0.02]
Subtotal (95% CI)			**47**			**52**	**100.0%**	**-0.45 [-0.85 , -0.05]**
Heterogeneity: Tau² = 0.00; Chi² = 0.05, df = 1 (P = 0.83); I² = 0%								
Test for overall effect: Z = 2.22 (P = 0.03)								
22.11.3 Secondary: interpersonal problems (continuous), at end of treatment								
Kramer 2011 (3)	-3.18	3.6	11	-0.71	2.16	14	23.8%	-0.83 [-1.66 , -0.00]
Kramer 2014 (3)	11.97	6.41	36	14.97	5.98	38	76.2%	-0.48 [-0.94 , -0.02]
Subtotal (95% CI)			**47**			**52**	**100.0%**	**-0.56 [-0.97 , -0.16]**
Heterogeneity: Tau² = 0.00; Chi² = 0.53, df = 1 (P = 0.47); I² = 0%								
Test for overall effect: Z = 2.73 (P = 0.006)								



Footnotes
(1) Self rated: BSL-23
(2) Self rated: OQ45, social role
(3) OQ-45 - interpersonal problems (SR)

Analysis 22.12. Comparison 22: Cognitive behavioural therapy (CBT) and related treatments vs active treatment, Outcome 12: MOTR vs (GPM), secondary: attrition (dichotomous), at end of treatment

Study or Subgroup	MOTR Events	MOTR Total	GPM Events	GPM Total	Weight	Risk Ratio M-H, Random, 95% CI
Kramer 2011	2	11	8	14	30.1%	0.32 [0.08 , 1.21]
Kramer 2014	11	42	14	43	69.9%	0.80 [0.41 , 1.56]
Total (95% CI)		**53**		**57**	**100.0%**	**0.61 [0.26 , 1.41]**
Total events:	13		22			
Heterogeneity: Tau² = 0.15; Chi² = 1.51, df = 1 (P = 0.22); I² = 34%						
Test for overall effect: Z = 1.16 (P = 0.25)						
Test for subgroup differences: Not applicable						



Comparison 23. Schema-focused therapy (SFT) vs active treatment

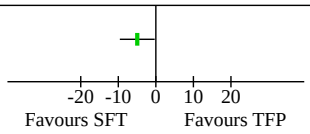
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
23.1 SFT vs TFP. Primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
23.2 SFT vs TFP. Secondary: attrition (dichotomous), at 0-6 months follow-up	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
23.3 SFT vs SFT + therapist availability (TA). Primary: BPD symptom severity (continuous), at end of treatment	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
23.4 SFT vs SFT + TA. Secondary: attrition (dichotomous), 0-6 months follow-up	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 23.1. Comparison 23: Schema-focused therapy (SFT) vs active treatment, Outcome 1: SFT vs TFP. Primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	TFP Mean	TFP SD	TFP Total	Mean Difference IV, Fixed, 95% CI
Giesen-Bloo 2006 (1)	17.7631	11.3231	44	22.7148	10.6149	42	-4.95 [-9.59 , -0.31]

Test for subgroup differences: Not applicable

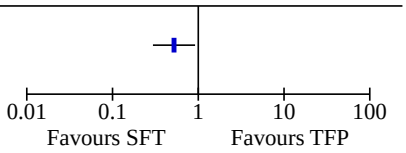


Footnotes
(1) Clinical rated: BPDSI-IV

Analysis 23.2. Comparison 23: Schema-focused therapy (SFT) vs active treatment, Outcome 2: SFT vs TFP. Secondary: attrition (dichotomous), at 0-6 months follow-up

Study or Subgroup	SFT Events	SFT Total	TFP Events	TFP Total	Risk Ratio M-H, Fixed, 95% CI
Giesen-Bloo 2006	12	45	22	43	0.52 [0.30 , 0.92]

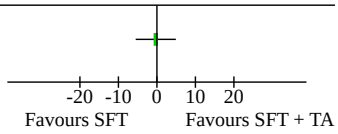
Test for subgroup differences: Not applicable



Analysis 23.3. Comparison 23: Schema-focused therapy (SFT) vs active treatment, Outcome 3: SFT vs SFT + therapist availability (TA). Primary: BPD symptom severity (continuous), at end of treatment

Study or Subgroup	SFT Mean	SFT SD	SFT Total	SFT + TA Mean	SFT + TA SD	SFT + TA Total	Mean Difference IV, Fixed, 95% CI
Nadort 2009 (1)	16.77	9.91	30	17.07	10.86	31	-0.30 [-5.51 , 4.91]

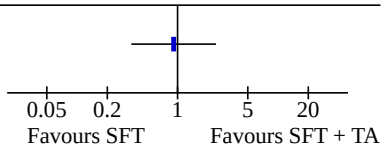
Test for subgroup differences: Not applicable



Footnotes
(1) Clinical rated: BPDSI-IV

Analysis 23.4. Comparison 23: Schema-focused therapy (SFT) vs active treatment, Outcome 4: SFT vs SFT + TA. Secondary: attrition (dichotomous), 0-6 months follow-up

Study or Subgroup	SFT Events	SFT Total	SFT + TA Events	SFT + TA Total	Risk Ratio M-H, Fixed, 95% CI
Nadort 2009	6	30	7	32	0.91 [0.35 , 2.41]
Test for subgroup differences: Not applicable					

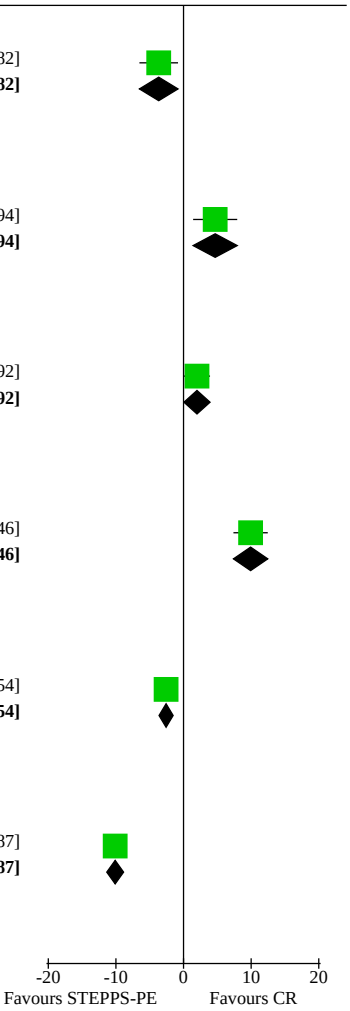


Comparison 24. Systems training for emotional predictability and problem solving-based psychoeducation (STEPPS-PE) vs cognitive rehabilitation (CR)

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
24.1 STEPPS-PE vs CR	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
24.1.1 Primary: BPD symptom severity (continuous), at end of treatment	1	46	Mean Difference (IV, Fixed, 95% CI)	-3.67 [-6.52, -0.82]
24.1.2 Primary: BPD symptom severity (continuous), at 0-6 months follow-up	1	42	Mean Difference (IV, Fixed, 95% CI)	4.68 [1.42, 7.94]
24.1.3 Secondary: impulsivity (continuous), at end of treatment	1	46	Mean Difference (IV, Fixed, 95% CI)	1.99 [0.06, 3.92]
24.1.4 Secondary: impulsivity (continuous), at 0-6 months follow-up	1	42	Mean Difference (IV, Fixed, 95% CI)	9.92 [7.38, 12.46]
24.1.5 Secondary: depression (continuous), at end of treatment	1	48	Mean Difference (IV, Fixed, 95% CI)	-2.58 [-3.62, -1.54]
24.1.6 Secondary: depression (continuous), at 0-6 months follow-up	1	42	Mean Difference (IV, Fixed, 95% CI)	-10.11 [-11.35, -8.87]
24.2 STEPPS-PE vs CR. Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only

Analysis 24.1. Comparison 24: Systems training for emotional predictability and problem solving-based psychoeducation (STEPPS-PE) vs cognitive rehabilitation (CR), Outcome 1: STEPPS-PE vs CR

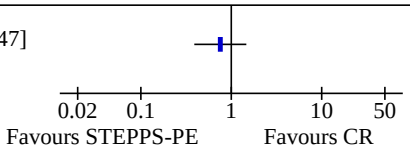
Study or Subgroup	STEPPS-PE Mean	SD	Total	CR Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
24.1.1 Primary: BPD symptom severity (continuous), at end of treatment								
Pascual 2015 (1)	38.89	4.86	24	42.56	5	22	100.0%	-3.67 [-6.52 , -0.82]
Subtotal (95% CI)			**24**			**22**	**100.0%**	**-3.67 [-6.52 , -0.82]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.52 (P = 0.01)								
24.1.2 Primary: BPD symptom severity (continuous), at 0-6 months follow-up								
Pascual 2015 (1)	39.59	5.53	22	34.91	5.25	20	100.0%	4.68 [1.42 , 7.94]
Subtotal (95% CI)			**22**			**20**	**100.0%**	**4.68 [1.42 , 7.94]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.81 (P = 0.005)								
24.1.3 Secondary: impulsivity (continuous), at end of treatment								
Pascual 2015 (2)	67.92	3.33	24	65.93	3.34	22	100.0%	1.99 [0.06 , 3.92]
Subtotal (95% CI)			**24**			**22**	**100.0%**	**1.99 [0.06 , 3.92]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.02 (P = 0.04)								
24.1.4 Secondary: impulsivity (continuous), at 0-6 months follow-up								
Pascual 2015 (2)	67.06	4.35	22	57.14	4.04	20	100.0%	9.92 [7.38 , 12.46]
Subtotal (95% CI)			**22**			**20**	**100.0%**	**9.92 [7.38 , 12.46]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 7.66 (P < 0.00001)								
24.1.5 Secondary: depression (continuous), at end of treatment								
Pascual 2015 (3)	16.58	1.85	24	19.16	1.83	24	100.0%	-2.58 [-3.62 , -1.54]
Subtotal (95% CI)			**24**			**24**	**100.0%**	**-2.58 [-3.62 , -1.54]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 4.86 (P < 0.00001)								
24.1.6 Secondary: depression (continuous), at 0-6 months follow-up								
Pascual 2015 (3)	9.91	2.13	22	20.02	1.98	20	100.0%	-10.11 [-11.35 , -8.87]
Subtotal (95% CI)			**22**			**20**	**100.0%**	**-10.11 [-11.35 , -8.87]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 15.94 (P < 0.00001)								



Footnotes
(1) BSL-23 (SR)
(2) BIS (SR)
(3) MADRS (CR)

Analysis 24.2. Comparison 24: Systems training for emotional predictability and problem solving-based psychoeducation (STEPPS-PE) vs cognitive rehabilitation (CR), Outcome 2: STEPPS-PE vs CR. Secondary: attrition (dichotomous), at end of treatment

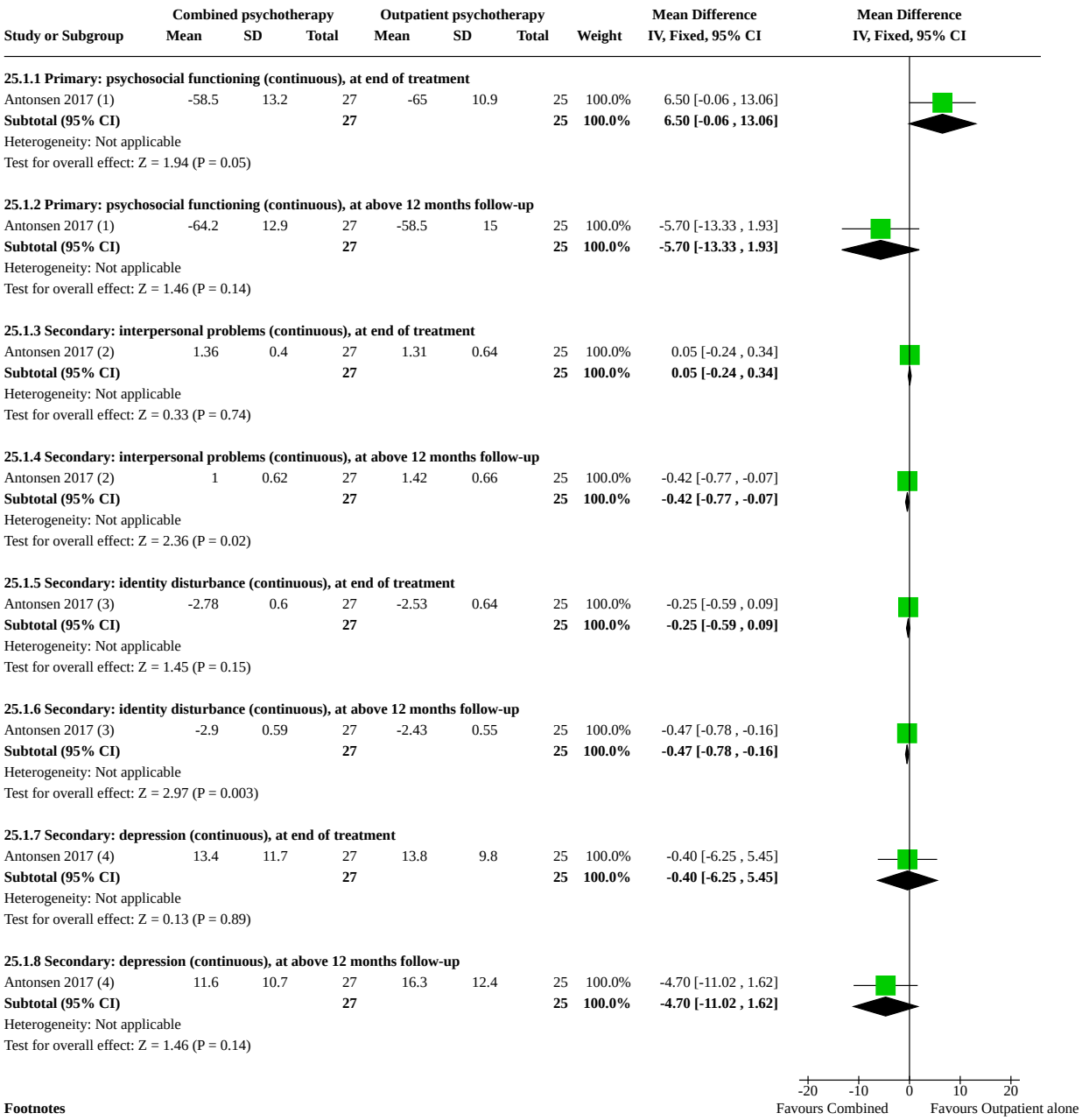
Study or Subgroup	STEPPS-PE Events	Total	CR Events	Total	Risk Ratio M-H, Fixed, 95% CI
Pascual 2015	10	34	14	36	0.76 [0.39 , 1.47]
Test for subgroup differences: Not applicable					



Comparison 25. Eclectic treatments vs active treatment

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
25.1 Combined inpatient and outpatient psychotherapy versus outpatient psychotherapy	1		Mean Difference (IV, Fixed, 95% CI)	Subtotals only
25.1.1 Primary: psychosocial functioning (continuous), at end of treatment	1	52	Mean Difference (IV, Fixed, 95% CI)	6.50 [-0.06, 13.06]
25.1.2 Primary: psychosocial functioning (continuous), at above 12 months follow-up	1	52	Mean Difference (IV, Fixed, 95% CI)	-5.70 [-13.33, 1.93]
25.1.3 Secondary: interpersonal problems (continuous), at end of treatment	1	52	Mean Difference (IV, Fixed, 95% CI)	0.05 [-0.24, 0.34]
25.1.4 Secondary: interpersonal problems (continuous), at above 12 months follow-up	1	52	Mean Difference (IV, Fixed, 95% CI)	-0.42 [-0.77, -0.07]
25.1.5 Secondary: identity disturbance (continuous), at end of treatment	1	52	Mean Difference (IV, Fixed, 95% CI)	-0.25 [-0.59, 0.09]
25.1.6 Secondary: identity disturbance (continuous), at above 12 months follow-up	1	52	Mean Difference (IV, Fixed, 95% CI)	-0.47 [-0.78, -0.16]
25.1.7 Secondary: depression (continuous), at end of treatment	1	52	Mean Difference (IV, Fixed, 95% CI)	-0.40 [-6.25, 5.45]
25.1.8 Secondary: depression (continuous), at above 12 months follow-up	1	52	Mean Difference (IV, Fixed, 95% CI)	-4.70 [-11.02, 1.62]
25.2 Combined inpatient and outpatient psychotherapy versus outpatient psychotherapy. Secondary: attrition (dichotomous), at end of treatment	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
25.3 integrative BPD-oriented adolescent family therapy (I-BAFT) vs individual drug counselling (IDC)	1		Risk Ratio (M-H, Fixed, 95% CI)	Subtotals only
25.3.1 Primary: BPD symptom severity (dichotomous), at end of treatment	1	40	Risk Ratio (M-H, Fixed, 95% CI)	0.91 [0.50, 1.64]
25.3.2 Secondary: attrition (dichotomous), at 6-12 months follow-up	1	40	Risk Ratio (M-H, Fixed, 95% CI)	0.50 [0.18, 1.40]

Analysis 25.1. Comparison 25: Eclectic treatments vs active treatment, Outcome 1: Combined inpatient and outpatient psychotherapy versus outpatient psychotherapy

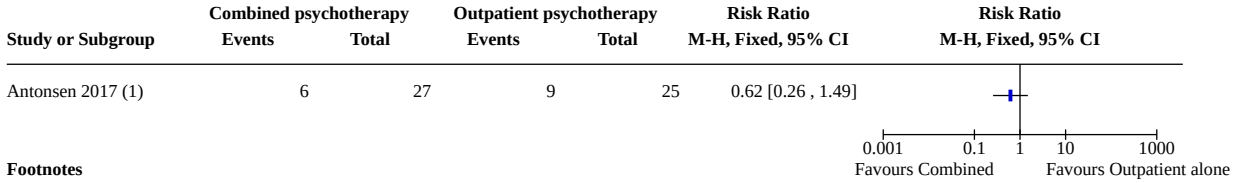


Study or Subgroup	Combined psychotherapy Mean	SD	Total	Outpatient psychotherapy Mean	SD	Total	Weight	Mean Difference IV, Fixed, 95% CI
25.1.1 Primary: psychosocial functioning (continuous), at end of treatment								
Antonsen 2017 (1)	-58.5	13.2	27	-65	10.9	25	100.0%	6.50 [-0.06 , 13.06]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**6.50 [-0.06 , 13.06]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.94 (P = 0.05)								
25.1.2 Primary: psychosocial functioning (continuous), at above 12 months follow-up								
Antonsen 2017 (1)	-64.2	12.9	27	-58.5	15	25	100.0%	-5.70 [-13.33 , 1.93]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**-5.70 [-13.33 , 1.93]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.46 (P = 0.14)								
25.1.3 Secondary: interpersonal problems (continuous), at end of treatment								
Antonsen 2017 (2)	1.36	0.4	27	1.31	0.64	25	100.0%	0.05 [-0.24 , 0.34]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**0.05 [-0.24 , 0.34]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.33 (P = 0.74)								
25.1.4 Secondary: interpersonal problems (continuous), at above 12 months follow-up								
Antonsen 2017 (2)	1	0.62	27	1.42	0.66	25	100.0%	-0.42 [-0.77 , -0.07]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**-0.42 [-0.77 , -0.07]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.36 (P = 0.02)								
25.1.5 Secondary: identity disturbance (continuous), at end of treatment								
Antonsen 2017 (3)	-2.78	0.6	27	-2.53	0.64	25	100.0%	-0.25 [-0.59 , 0.09]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**-0.25 [-0.59 , 0.09]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.45 (P = 0.15)								
25.1.6 Secondary: identity disturbance (continuous), at above 12 months follow-up								
Antonsen 2017 (3)	-2.9	0.59	27	-2.43	0.55	25	100.0%	-0.47 [-0.78 , -0.16]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**-0.47 [-0.78 , -0.16]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.97 (P = 0.003)								
25.1.7 Secondary: depression (continuous), at end of treatment								
Antonsen 2017 (4)	13.4	11.7	27	13.8	9.8	25	100.0%	-0.40 [-6.25 , 5.45]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**-0.40 [-6.25 , 5.45]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.13 (P = 0.89)								
25.1.8 Secondary: depression (continuous), at above 12 months follow-up								
Antonsen 2017 (4)	11.6	10.7	27	16.3	12.4	25	100.0%	-4.70 [-11.02 , 1.62]
Subtotal (95% CI)			**27**			**25**	**100.0%**	**-4.70 [-11.02 , 1.62]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.46 (P = 0.14)								

Footnotes

(1) Clinician rated: GAF
(2) Self reported: CIP
(3) Self reported: SIPP
(4) Self rated: BDI

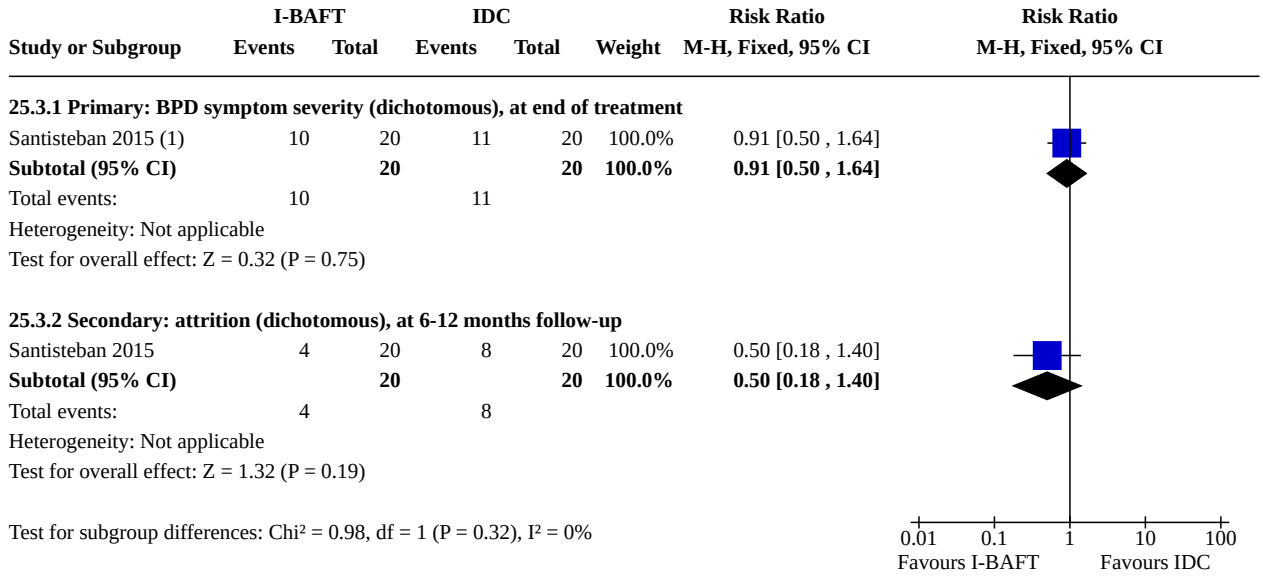
Analysis 25.2. Comparison 25: Eclectic treatments vs active treatment, Outcome 2: Combined inpatient and outpatient psychotherapy versus outpatient psychotherapy. Secondary: attrition (dichotomous), at end of treatment



Footnotes

(1) drop-outs at 3-year follow-up (time point closest to average treatment end at 28 months)

Analysis 25.3. Comparison 25: Eclectic treatments vs active treatment, Outcome 3: integrative BPD-oriented adolescent family therapy (I-BAFT) vs individual drug counselling (IDC)



Footnotes

(1) not improved or recovered

Comparison 26. Subgroup analysis: therapeutic approaches

Outcome or sub-group title	No. of studies	No. of partici-pants	Statistical method	Effect size
26.1 BPD symptom severity	23		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
26.1.1 DBT	3	149	Std. Mean Difference (IV, Random, 95% CI)	-0.60 [-1.05, -0.14]
26.1.2 MBT	5	267	Std. Mean Difference (IV, Random, 95% CI)	-0.13 [-0.38, 0.11]
26.1.3 Psychodynamic psychotherapy	4	222	Std. Mean Difference (IV, Random, 95% CI)	-0.29 [-0.66, 0.09]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
26.1.4 STEPPS	3	273	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.63, -0.15]
26.1.5 Eclectic treatments	3	134	Std. Mean Difference (IV, Random, 95% CI)	-0.90 [-1.57, -0.23]
26.1.6 ACT	1	41	Std. Mean Difference (IV, Random, 95% CI)	-1.22 [-1.89, -0.55]
26.1.7 CBT	1	26	Std. Mean Difference (IV, Random, 95% CI)	-1.28 [-2.14, -0.42]
26.1.8 SFT	1	28	Std. Mean Difference (IV, Random, 95% CI)	-1.66 [-2.54, -0.78]
26.1.9 CAT	1	9	Std. Mean Difference (IV, Random, 95% CI)	-0.53 [-1.88, 0.83]
26.1.10 Tranference-focused psychotherapy	1	104	Std. Mean Difference (IV, Random, 95% CI)	-0.55 [-0.95, -0.16]
26.2 Psychosocial functioning	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
26.2.1 DBT	6	225	Std. Mean Difference (IV, Random, 95% CI)	-0.36 [-0.69, -0.03]
26.2.2 MBT	3	239	Std. Mean Difference (IV, Random, 95% CI)	-0.54 [-1.24, 0.16]
26.2.3 Psychodynamic psychotherapy	4	140	Std. Mean Difference (IV, Random, 95% CI)	-0.69 [-1.98, 0.59]
26.2.4 Eclectic treatments	2	231	Std. Mean Difference (IV, Random, 95% CI)	-0.57 [-1.10, -0.04]
26.2.5 CBT	1	99	Std. Mean Difference (IV, Random, 95% CI)	0.00 [-0.39, 0.39]
26.2.6 SFT	1	28	Std. Mean Difference (IV, Random, 95% CI)	-1.20 [-2.03, -0.38]
26.2.7 STEPPS	1	124	Std. Mean Difference (IV, Random, 95% CI)	-0.55 [-0.91, -0.19]
26.2.8 CAT	1	9	Std. Mean Difference (IV, Random, 95% CI)	-1.22 [-2.73, 0.30]
26.2.9 Motivation feedback	1	43	Std. Mean Difference (IV, Random, 95% CI)	-0.07 [-0.69, 0.55]
26.2.10 Tranference-focused psychotherapy	1	104	Std. Mean Difference (IV, Random, 95% CI)	-0.34 [-0.73, 0.05]

Outcome or sub-group title	No. of studies	No. of partici-pants	Statistical method	Effect size
26.2.11 Once-only in-tervention	1	72	Std. Mean Difference (IV, Random, 95% CI)	0.03 [-0.43, 0.49]

Analysis 26.1. Comparison 26: Subgroup analysis: therapeutic approaches, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
26.1.1 DBT								
Koons 2001a (1)	3.6	1.6	10	4.2	2.3	10	20.0%	-0.29 [-1.17 , 0.59]
Priebe 2012 (2)	13.1	6.9	33	15.9	7.5	37	42.7%	-0.38 [-0.86 , 0.09]
Soler 2009 (3)	3.5	1.2	29	4.44	0.52	30	37.3%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**72**			**77**	**100.0%**	**-0.60 [-1.05 , -0.14]**
Heterogeneity: Tau² = 0.07; Chi² = 3.45, df = 2 (P = 0.18); I² = 42%								
Test for overall effect: Z = 2.57 (P = 0.01)								
26.1.2 MBT								
Jørgensen 2013 (4)	2.8	2.5	42	3.6	2.1	24	23.3%	-0.33 [-0.84 , 0.17]
Laurenssen 2018 (5)	20.63	11.45	54	21.39	10.43	41	36.0%	-0.07 [-0.47 , 0.34]
Philips 2018 (6)	17	9.1	13	20.7	9.1	11	9.0%	-0.39 [-1.20 , 0.42]
Robinson 2016 (7)	9.64	7.41	12	9.27	7.39	11	8.9%	0.05 [-0.77 , 0.87]
Rossouw 2012b (8)	2.79	0.5385	29	3.06	65.7267	30	22.8%	-0.01 [-0.52 , 0.50]
Subtotal (95% CI)			**150**			**117**	**100.0%**	**-0.13 [-0.38 , 0.11]**
Heterogeneity: Tau² = 0.00; Chi² = 1.53, df = 4 (P = 0.82); I² = 0%								
Test for overall effect: Z = 1.09 (P = 0.28)								
26.1.3 Psychodynamic psychotherapy								
Amianto 2011 (9)	3.3	1	16	3.3	1.1	17	20.5%	0.00 [-0.68 , 0.68]
Gregory 2008b (10)	33.6	12.4	10	38.4	8.62	13	15.3%	-0.44 [-1.28 , 0.39]
Leichsenring 2016 (11)	18.76	8.6	64	19.41	9.38	58	41.2%	-0.07 [-0.43 , 0.28]
Reneses 2013 (12)	13	7.9	18	19.1	6.9	26	23.0%	-0.82 [-1.45 , -0.19]
Subtotal (95% CI)			**108**			**114**	**100.0%**	**-0.29 [-0.66 , 0.09]**
Heterogeneity: Tau² = 0.06; Chi² = 4.83, df = 3 (P = 0.18); I² = 38%								
Test for overall effect: Z = 1.50 (P = 0.13)								
26.1.4 STEPPS								
Blum 2008 (13)	9.8	8.0623	65	13.4	7.6811	59	45.2%	-0.45 [-0.81 , -0.10]
Bos 2010 (14)	79.7	25.8	26	95.1	29.1	26	18.7%	-0.55 [-1.11 , 0.00]
Schuppert 2012 (15)	13.29	9.53	48	15.39	9	49	36.1%	-0.22 [-0.62 , 0.17]
Subtotal (95% CI)			**139**			**134**	**100.0%**	**-0.39 [-0.63 , -0.15]**
Heterogeneity: Tau² = 0.00; Chi² = 1.11, df = 2 (P = 0.58); I² = 0%								
Test for overall effect: Z = 3.18 (P = 0.001)								
26.1.5 Eclectic treatments								
Gratz 2006 (10)	25.83	5.72	12	34.7	10.81	10	26.2%	-1.02 [-1.92 , -0.11]
Gratz 2014 (10)	27.47	6.59	31	35.88	5.59	30	37.1%	-1.36 [-1.92 , -0.80]
Leppänen 2016 (16)	17.54	10.14	19	21.48	11.41	32	36.7%	-0.35 [-0.93 , 0.22]
Subtotal (95% CI)			**62**			**72**	**100.0%**	**-0.90 [-1.57 , -0.23]**
Heterogeneity: Tau² = 0.23; Chi² = 6.11, df = 2 (P = 0.05); I² = 67%								
Test for overall effect: Z = 2.64 (P = 0.008)								
26.1.6 ACT								
Morton 2012 (17)	32.76	12.47	21	47.42	11	20	100.0%	-1.22 [-1.89 , -0.55]
Subtotal (95% CI)			**21**			**20**	**100.0%**	**-1.22 [-1.89 , -0.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.56 (P = 0.0004)								
26.1.7 CBT								
Kredlow 2017a (4)	1.17	1.17	14	4.25	3.2	12	100.0%	-1.28 [-2.14 , -0.42]
Subtotal (95% CI)			**14**			**12**	**100.0%**	**-1.28 [-2.14 , -0.42]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.92 (P = 0.003)								
26.1.8 SFT								
Farrell 2009 (18)	18.81	9.47	16	32.75	5.9	12	100.0%	-1.66 [-2.54 , -0.78]
Subtotal (95% CI)			**16**			**12**	**100.0%**	**-1.66 [-2.54 , -0.78]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.68 (P = 0.0002)								

Analysis 26.1. (Continued)

Heterogeneity: Not applicable
Test for overall effect: Z = 3.68 (P = 0.0002)

26.1.9 CAT

Gleeson 2012 (19)	0.8	1	4	2.2	3	5	100.0%	-0.53 [-1.88 , 0.83]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-0.53 [-1.88 , 0.83]**

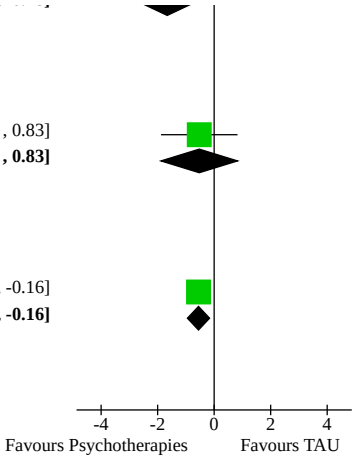
Heterogeneity: Not applicable
Test for overall effect: Z = 0.76 (P = 0.45)

26.1.10 Tranference-focused psychotherapy

Doering 2010 (20)	4.79	1.54	52	5.63	1.47	52	100.0%	-0.55 [-0.95 , -0.16]
Subtotal (95% CI)			**52**			**52**	**100.0%**	**-0.55 [-0.95 , -0.16]**

Heterogeneity: Not applicable
Test for overall effect: Z = 2.77 (P = 0.006)

Test for subgroup differences: Chi² = 25.65, df = 9 (P = 0.002), I² = 64.9%

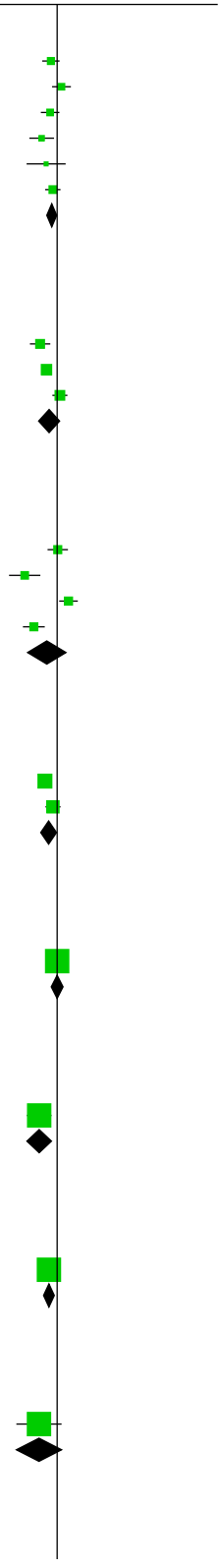


Footnotes

(1) SCID-II - mean number of BPD criteria met (CR)
(2) ZAN-BPD total (CR)
(3) CCGI-BPD global (CR)
(4) SCID-BPD (CR)
(5) BPDSI-IV (CR)
(6) BPDSI-IV-total (CR)
(7) Zan-BPD-total (CR)
(8) BPFS-C (SR)
(9) Clinician rated: CGI-BPD
(10) BEST (SR)
(11) Self rated: Borderline Personality Inventory
(12) Clinician rated: ZAN-BPD
(13) Zan-BPD - total (CR)
(14) Self reported: BPD-40
(15) BPDSI-IV total
(16) Clinician-rated: BPDSI-IV
(17) Self rated: BEST
(18) Self rated: BSI
(19) OAS-M - suicidality (CR)
(20) Clinician-rated: Mean number of DSM-IV BPD criteria met

Analysis 26.2. Comparison 26: Subgroup analysis: therapeutic approaches, Outcome 2: Psychosocial functioning

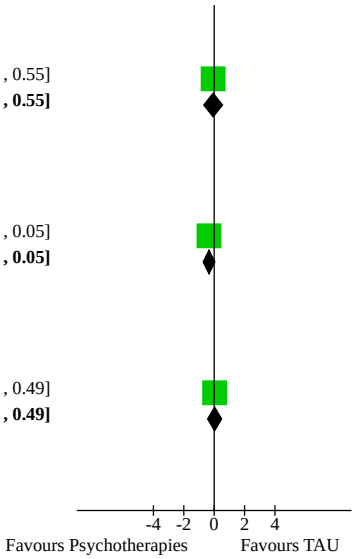
Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
26.2.1 DBT								
Carter 2010 (1)	8.15	11.48	20	13.07	11.59	28	20.6%	-0.42 [-1.00 , 0.16]
Feigenbaum 2012 (2)	2.48	0.85	25	2.22	0.92	16	18.5%	0.29 [-0.34 , 0.92]
Kramer 2016 (3)	12.76	7.79	21	16	5.42	20	18.8%	-0.47 [-1.09 , 0.15]
Linehan 1994 (4)	-51.42	9.71	13	-40.43	10.8	13	12.5%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (5)	-59.4	6.6	5	-54.2	6.1	5	5.8%	-0.74 [-2.05 , 0.57]
Soler 2009 (6)	3.27	0.9	29	3.57	1.13	30	23.9%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**113**			**112**	**100.0%**	**-0.36 [-0.69 , -0.03]**
Heterogeneity: Tau² = 0.05; Chi² = 7.20, df = 5 (P = 0.21); I² = 31%								
Test for overall effect: Z = 2.14 (P = 0.03)								
26.2.2 MBT								
Bateman 1999 (7)	2.7	0.6	20	3.4	0.6	19	29.4%	-1.14 [-1.83 , -0.46]
Bateman 2009 (7)	1.76	0.5	71	2.17	0.64	63	36.9%	-0.72 [-1.07 , -0.36]
Jørgensen 2013 (7)	2.2	0.5	42	2.1	0.6	24	33.7%	0.18 [-0.32 , 0.69]
Subtotal (95% CI)			**133**			**106**	**100.0%**	**-0.54 [-1.24 , 0.16]**
Heterogeneity: Tau² = 0.32; Chi² = 11.92, df = 2 (P = 0.003); I² = 83%								
Test for overall effect: Z = 1.50 (P = 0.13)								
26.2.3 Psychodynamic psychotherapy								
Amianto 2011 (8)	-65.9	11.2	16	-66.4	13	17	25.6%	0.04 [-0.64 , 0.72]
Gregory 2008b (9)	-9.7	8.1	11	6.9	6.7	13	23.3%	-2.17 [-3.22 , -1.13]
Reneses 2013 (10)	35.4	8.9	18	27.6	10.8	26	25.9%	0.76 [0.14 , 1.38]
Salzer 2014 (11)	-65	9.84	17	-51.82	6.82	22	25.3%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**62**			**78**	**100.0%**	**-0.69 [-1.98 , 0.59]**
Heterogeneity: Tau² = 1.57; Chi² = 35.63, df = 3 (P < 0.00001); I² = 92%								
Test for overall effect: Z = 1.06 (P = 0.29)								
26.2.4 Eclectic treatments								
Andreoli 2016 (12)	-62.95	6.2343	140	-57.6	7.6	30	54.0%	-0.82 [-1.22 , -0.42]
Gratz 2014 (13)	14.25	6.24	31	16.01	6.24	30	46.0%	-0.28 [-0.78 , 0.23]
Subtotal (95% CI)			**171**			**60**	**100.0%**	**-0.57 [-1.10 , -0.04]**
Heterogeneity: Tau² = 0.09; Chi² = 2.70, df = 1 (P = 0.10); I² = 63%								
Test for overall effect: Z = 2.12 (P = 0.03)								
26.2.5 CBT								
Davidson 2006 (14)	13.1	4.4	52	13.1	4.6	47	100.0%	0.00 [-0.39 , 0.39]
Subtotal (95% CI)			**52**			**47**	**100.0%**	**0.00 [-0.39 , 0.39]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								
26.2.6 SFT								
Farrell 2009 (8)	-60.5	10.17	16	-50.08	5.07	12	100.0%	-1.20 [-2.03 , -0.38]
Subtotal (95% CI)			**16**			**12**	**100.0%**	**-1.20 [-2.03 , -0.38]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.87 (P = 0.004)								
26.2.7 STEPPS								
Blum 2008 (4)	-50.5	12.8996	65	-43.5	12.2898	59	100.0%	-0.55 [-0.91 , -0.19]
Subtotal (95% CI)			**65**			**59**	**100.0%**	**-0.55 [-0.91 , -0.19]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.01 (P = 0.003)								
26.2.8 CAT								
Gleeson 2012 (15)	-67	8.3	4	-50.6	14.1	5	100.0%	-1.22 [-2.73 , 0.30]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-1.22 [-2.73 , 0.30]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.58 (P = 0.11)								
26.2.9 Motivation feedback								



Analysis 26.2. (Continued)

26.2.9 Motivation feedback								
Jochems 2015 (16)	12.8	6.36	16	13.22	5.8	27	100.0%	-0.07 [-0.69 , 0.55]
Subtotal (95% CI)			**16**			**27**	**100.0%**	**-0.07 [-0.69 , 0.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.22 (P = 0.83)								
26.2.10 Tranference-focused psychotherapy								
Doering 2010 (17)	-58.62	8.04	52	-56.06	6.87	52	100.0%	-0.34 [-0.73 , 0.05]
Subtotal (95% CI)			**52**			**52**	**100.0%**	**-0.34 [-0.73 , 0.05]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.72 (P = 0.09)								
26.2.11 Once-only intervention								
Borschmann 2013 (18)	26.06	7.98	36	25.81	8.94	36	100.0%	0.03 [-0.43 , 0.49]
Subtotal (95% CI)			**36**			**36**	**100.0%**	**0.03 [-0.43 , 0.49]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.12 (P = 0.90)								

Test for subgroup differences: Chi² = 14.26, df = 10 (P = 0.16), I² = 29.9%



Footnotes

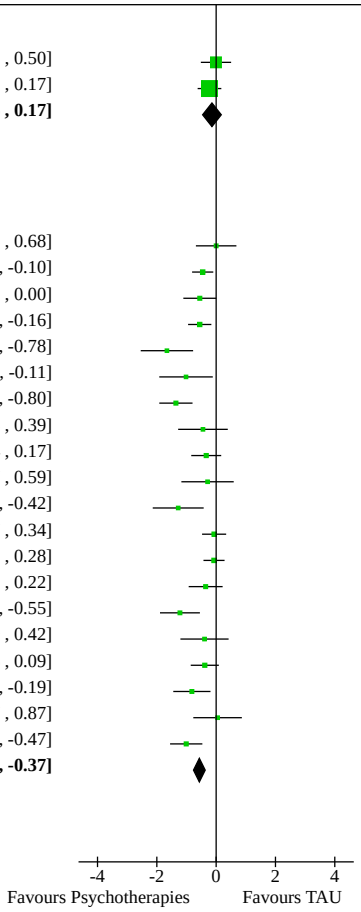
(1) BDQ-days out of role (SR)
(2) CORE-OM (SR)
(3) OQ45, social role at discharge (SR)
(4) GAS (CR)
(5) C-GAS (CR)
(6) CGI-global improvement, patient-rated (SR)
(7) SAS-SR (SR)
(8) Clinician rated: GAF
(9) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(10) Self reported: SAS-SR (higher scores indicate poorer functioning)
(11) GAF (CR)
(12) Clinician rated: GAS
(13) Self rated: SDS
(14) Self rated: SFQ
(15) SOFAS (CR)
(16) Clinician-rated: HoNOS
(17) Clinician-rated: GAF
(18) WSAS (SR)

Comparison 27. Subgroup analysis: age

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
27.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
27.1.1 15 to 18 years old	2	156	Std. Mean Difference (IV, Random, 95% CI)	-0.14 [-0.46, 0.17]
27.1.2 Above 18 years old	20	1088	Std. Mean Difference (IV, Random, 95% CI)	-0.57 [-0.76, -0.37]

Analysis 27.1. Comparison 27: Subgroup analysis: age, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
27.1.1 15 to 18 years old								
Rossouw 2012b (1)	2.79	0.5385	29	3.06	65.7267	30	38.0%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (2)	13.29	9.53	48	15.39	9	49	62.0%	-0.22 [-0.62 , 0.17]
Subtotal (95% CI)			**77**			**79**	**100.0%**	**-0.14 [-0.46 , 0.17]**
Heterogeneity: Tau² = 0.00; Chi² = 0.44, df = 1 (P = 0.51); I² = 0%								
Test for overall effect: Z = 0.88 (P = 0.38)								
27.1.2 Above 18 years old								
Amianto 2011 (3)	3.3	1	16	3.3	1.1	17	4.5%	0.00 [-0.68 , 0.68]
Blum 2008 (4)	9.8	8.0623	65	13.4	7.6811	59	7.3%	-0.45 [-0.81 , -0.10]
Bos 2010 (5)	79.7	25.8	26	95.1	29.1	26	5.5%	-0.55 [-1.11 , 0.00]
Doering 2010 (6)	4.79	1.54	52	5.63	1.47	52	7.0%	-0.55 [-0.95 , -0.16]
Farrell 2009 (7)	18.81	9.47	16	32.75	5.9	12	3.3%	-1.66 [-2.54 , -0.78]
Gratz 2006 (8)	25.83	5.72	12	34.7	10.81	10	3.2%	-1.02 [-1.92 , -0.11]
Gratz 2014 (8)	27.47	6.59	31	35.88	5.59	30	5.4%	-1.36 [-1.92 , -0.80]
Gregory 2008b (8)	33.6	12.4	10	38.4	8.62	13	3.5%	-0.44 [-1.28 , 0.39]
Jørgensen 2013 (9)	2.8	2.5	42	3.6	2.1	24	5.9%	-0.33 [-0.84 , 0.17]
Koons 2001a (10)	3.6	1.6	10	4.2	2.3	10	3.3%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (9)	1.17	1.17	14	4.25	3.2	12	3.4%	-1.28 [-2.14 , -0.42]
Laurenssen 2018 (11)	20.63	11.45	54	21.39	10.43	41	6.8%	-0.07 [-0.47 , 0.34]
Leichsenring 2016 (12)	18.76	8.6	64	19.41	9.38	58	7.3%	-0.07 [-0.43 , 0.28]
Leppänen 2016 (13)	17.54	10.14	19	21.48	11.41	32	5.3%	-0.35 [-0.93 , 0.22]
Morton 2012 (14)	32.76	12.47	21	47.42	11	20	4.5%	-1.22 [-1.89 , -0.55]
Philips 2018 (15)	17	9.1	13	20.7	9.1	11	3.7%	-0.39 [-1.20 , 0.42]
Priebe 2012 (16)	13.1	6.9	33	15.9	7.5	37	6.2%	-0.38 [-0.86 , 0.09]
Reneses 2013 (17)	13	7.9	18	19.1	6.9	26	4.9%	-0.82 [-1.45 , -0.19]
Robinson 2016 (18)	9.64	7.41	12	9.27	7.39	11	3.6%	0.05 [-0.77 , 0.87]
Soler 2009 (19)	3.5	1.2	29	4.44	0.52	30	5.5%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**557**			**531**	**100.0%**	**-0.57 [-0.76 , -0.37]**
Heterogeneity: Tau² = 0.11; Chi² = 43.86, df = 19 (P = 0.0010); I² = 57%								
Test for overall effect: Z = 5.63 (P < 0.00001)								
Test for subgroup differences: Chi² = 5.03, df = 1 (P = 0.02), I² = 80.1%								



Footnotes

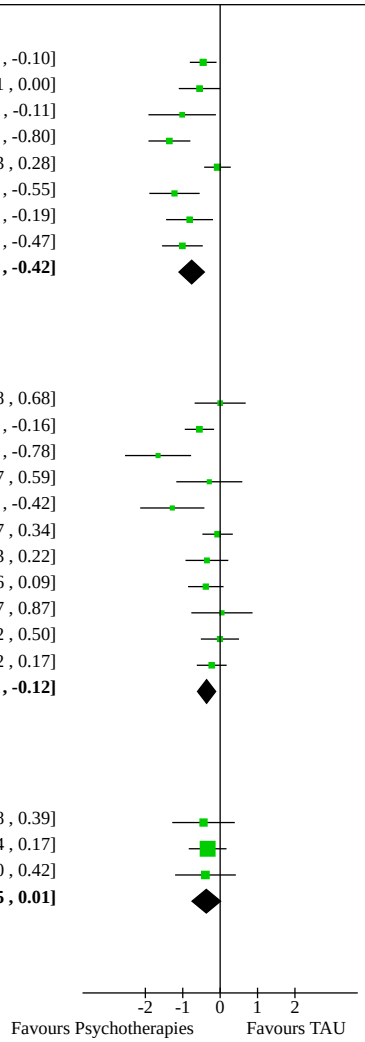
(1) BPFS-C (SR)
(2) BPDSI-IV total
(3) Clinician rated: CGI-BPD
(4) Zan-BPD - total (CR)
(5) Self reported: BPD-40
(6) Clinician-rated: Mean number of DSM-IV BPD criteria met
(7) Self rated: BSI
(8) BEST (SR)
(9) SCID-BPD (CR)
(10) SCID-II - mean number of BPD criteria met (CR)
(11) BPDSI-IV (CR)
(12) Self rated: Borderline Personality Inventory
(13) Clinician-rated: BPDSI-IV
(14) Self rated: BEST
(15) BPDSI-IV-total (CR)
(16) ZAN-BPD total (CR)
(17) Clinician rated: ZAN-BPD
(18) Zan-BPD-total (CR)
(19) CCGI-BPD global (CR)

Comparison 28. Subgroup analysis: duration

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
28.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
28.1.1 Less than 6 months	8	525	Std. Mean Difference (IV, Random, 95% CI)	-0.76 [-1.10, -0.42]
28.1.2 6 to 12 months	11	606	Std. Mean Difference (IV, Random, 95% CI)	-0.36 [-0.60, -0.12]
28.1.3 Above 12 months	3	113	Std. Mean Difference (IV, Random, 95% CI)	-0.37 [-0.75, 0.01]
28.2 Psychosocial functioning	20		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
28.2.1 Less than 6 months	6	468	Std. Mean Difference (IV, Random, 95% CI)	-0.31 [-0.73, 0.11]
28.2.2 6 to 12 months	10	535	Std. Mean Difference (IV, Random, 95% CI)	-0.25 [-0.49, -0.01]
28.2.3 Over 12 months	4	263	Std. Mean Difference (IV, Random, 95% CI)	-0.86 [-1.62, -0.10]

Analysis 28.1. Comparison 28: Subgroup analysis: duration, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
28.1.1 Less than 6 months								
Blum 2008 (1)	9.8	8.0623	65	13.4	7.6811	59	15.7%	-0.45 [-0.81 , -0.10]
Bos 2010 (2)	79.7	25.8	26	95.1	29.1	26	12.6%	-0.55 [-1.11 , 0.00]
Gratz 2006 (3)	25.83	5.72	12	34.7	10.81	10	8.1%	-1.02 [-1.92 , -0.11]
Gratz 2014 (3)	27.47	6.59	31	35.88	5.59	30	12.5%	-1.36 [-1.92 , -0.80]
Leichsenring 2016 (4)	18.76	8.6	64	19.41	9.38	58	15.8%	-0.07 [-0.43 , 0.28]
Morton 2012 (5)	32.76	12.47	21	47.42	11	20	10.9%	-1.22 [-1.89 , -0.55]
Reneses 2013 (6)	13	7.9	18	19.1	6.9	26	11.5%	-0.82 [-1.45 , -0.19]
Soler 2009 (7)	3.5	1.2	29	4.44	0.52	30	12.8%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**266**			**259**	**100.0%**	**-0.76 [-1.10 , -0.42]**
Heterogeneity: Tau² = 0.16; Chi² = 22.82, df = 7 (P = 0.002); I² = 69%								
Test for overall effect: Z = 4.40 (P < 0.0001)								
28.1.2 6 to 12 months								
Amianto 2011 (8)	3.3	1	16	3.3	1.1	17	7.7%	0.00 [-0.68 , 0.68]
Doering 2010 (9)	4.79	1.54	52	5.63	1.47	52	13.0%	-0.55 [-0.95 , -0.16]
Farrell 2009 (10)	18.81	9.47	16	32.75	5.9	12	5.4%	-1.66 [-2.54 , -0.78]
Koons 2001a (11)	3.6	1.6	10	4.2	2.3	10	5.5%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (12)	1.17	1.17	14	4.25	3.2	12	5.7%	-1.28 [-2.14 , -0.42]
Laurenssen 2018 (13)	20.63	11.45	54	21.39	10.43	41	12.7%	-0.07 [-0.47 , 0.34]
Leppänen 2016 (14)	17.54	10.14	19	21.48	11.41	32	9.4%	-0.35 [-0.93 , 0.22]
Priebe 2012 (15)	13.1	6.9	33	15.9	7.5	37	11.2%	-0.38 [-0.86 , 0.09]
Robinson 2016 (16)	9.64	7.41	12	9.27	7.39	11	6.1%	0.05 [-0.77 , 0.87]
Rossouw 2012b (17)	2.79	0.5385	29	3.06	65.7267	30	10.5%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (18)	13.29	9.53	48	15.39	9	49	12.8%	-0.22 [-0.62 , 0.17]
Subtotal (95% CI)			**303**			**303**	**100.0%**	**-0.36 [-0.60 , -0.12]**
Heterogeneity: Tau² = 0.08; Chi² = 19.85, df = 10 (P = 0.03); I² = 50%								
Test for overall effect: Z = 2.93 (P = 0.003)								
28.1.3 Above 12 months								
Gregory 2008b (3)	33.6	12.4	10	38.4	8.62	13	20.8%	-0.44 [-1.28 , 0.39]
Jørgensen 2013 (12)	2.8	2.5	42	3.6	2.1	24	57.1%	-0.33 [-0.84 , 0.17]
Philips 2018 (19)	17	9.1	13	20.7	9.1	11	22.1%	-0.39 [-1.20 , 0.42]
Subtotal (95% CI)			**65**			**48**	**100.0%**	**-0.37 [-0.75 , 0.01]**
Heterogeneity: Tau² = 0.00; Chi² = 0.05, df = 2 (P = 0.97); I² = 0%								
Test for overall effect: Z = 1.90 (P = 0.06)								
Test for subgroup differences: Chi² = 3.86, df = 2 (P = 0.15), I² = 48.2%								

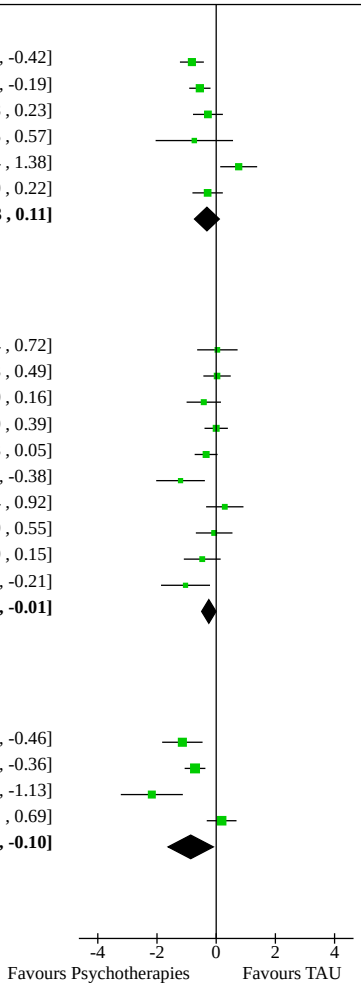


Footnotes

(1) Zan-BPD - total (CR)
(2) Self reported: BPD-40
(3) BEST (SR)
(4) Self rated: Borderline Personality Inventory
(5) Self rated: BEST
(6) Clinician rated: ZAN-BPD
(7) CCGI-BPD global (CR)
(8) Clinician rated: CGI-BPD
(9) Clinician-rated: Mean number of DSM-IV BPD criteria met
(10) Self rated: BSI
(11) SCID-II - mean number of BPD criteria met (CR)
(12) SCID-BPD (CR)
(13) BPDSI-IV (CR)
(14) Clinician-rated: BPDSI-IV
(15) ZAN-BPD total (CR)
(16) Zan-BPD-total (CR)
(17) BPFS-C (SR)
(18) BPDSI-IV total
(19) BPDSI-IV-total (CR)

Analysis 28.2. Comparison 28: Subgroup analysis: duration, Outcome 2: Psychosocial functioning

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
28.2.1 Less than 6 months								
Andreoli 2016 (1)	-62.95	6.2343	140	-57.6	7.6	30	20.0%	-0.82 [-1.22 , -0.42]
Blum 2008 (2)	-50.5	12.8996	65	-43.5	12.2898	59	20.8%	-0.55 [-0.91 , -0.19]
Gratz 2014 (3)	14.25	6.24	31	16.01	6.24	30	18.1%	-0.28 [-0.78 , 0.23]
Mehlum 2014 (4)	-59.4	6.6	5	-54.2	6.1	5	7.2%	-0.74 [-2.05 , 0.57]
Reneses 2013 (5)	35.4	8.9	18	27.6	10.8	26	15.9%	0.76 [0.14 , 1.38]
Soler 2009 (6)	3.27	0.9	29	3.57	1.13	30	17.9%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**288**			**180**	**100.0%**	**-0.31 [-0.73 , 0.11]**
Heterogeneity: Tau² = 0.19; Chi² = 18.80, df = 5 (P = 0.002); I² = 73%								
Test for overall effect: Z = 1.47 (P = 0.14)								
28.2.2 6 to 12 months								
Amianto 2011 (7)	-65.9	11.2	16	-66.4	13	17	8.2%	0.04 [-0.64 , 0.72]
Borschmann 2013 (8)	26.06	7.98	36	25.81	8.94	36	12.6%	0.03 [-0.43 , 0.49]
Carter 2010 (9)	8.15	11.48	20	13.07	11.59	28	10.0%	-0.42 [-1.00 , 0.16]
Davidson 2006 (10)	13.1	4.4	52	13.1	4.6	47	14.4%	0.00 [-0.39 , 0.39]
Doering 2010 (11)	-58.62	8.04	52	-56.06	6.87	52	14.6%	-0.34 [-0.73 , 0.05]
Farrell 2009 (7)	-60.5	10.17	16	-50.08	5.07	12	6.3%	-1.20 [-2.03 , -0.38]
Feigenbaum 2012 (12)	2.48	0.85	25	2.22	0.92	16	9.0%	0.29 [-0.34 , 0.92]
Jochems 2015 (13)	12.8	6.36	16	13.22	5.8	27	9.3%	-0.07 [-0.69 , 0.55]
Kramer 2016 (14)	12.76	7.79	21	16	5.42	20	9.2%	-0.47 [-1.09 , 0.15]
Linehan 1994 (2)	-51.42	9.71	13	-40.43	10.8	13	6.3%	-1.04 [-1.86 , -0.21]
Subtotal (95% CI)			**267**			**268**	**100.0%**	**-0.25 [-0.49 , -0.01]**
Heterogeneity: Tau² = 0.07; Chi² = 16.31, df = 9 (P = 0.06); I² = 45%								
Test for overall effect: Z = 2.02 (P = 0.04)								
28.2.3 Over 12 months								
Bateman 1999 (15)	2.7	0.6	20	3.4	0.6	19	24.6%	-1.14 [-1.83 , -0.46]
Bateman 2009 (15)	1.76	0.5	71	2.17	0.64	63	28.8%	-0.72 [-1.07 , -0.36]
Gregory 2008b (16)	-9.7	8.1	11	6.9	6.7	13	19.4%	-2.17 [-3.22 , -1.13]
Jørgensen 2013 (15)	2.2	0.5	42	2.1	0.6	24	27.1%	0.18 [-0.32 , 0.69]
Subtotal (95% CI)			**144**			**119**	**100.0%**	**-0.86 [-1.62 , -0.10]**
Heterogeneity: Tau² = 0.49; Chi² = 20.82, df = 3 (P = 0.0001); I² = 86%								
Test for overall effect: Z = 2.21 (P = 0.03)								
Test for subgroup differences: Chi² = 2.24, df = 2 (P = 0.33), I² = 10.9%								



Footnotes

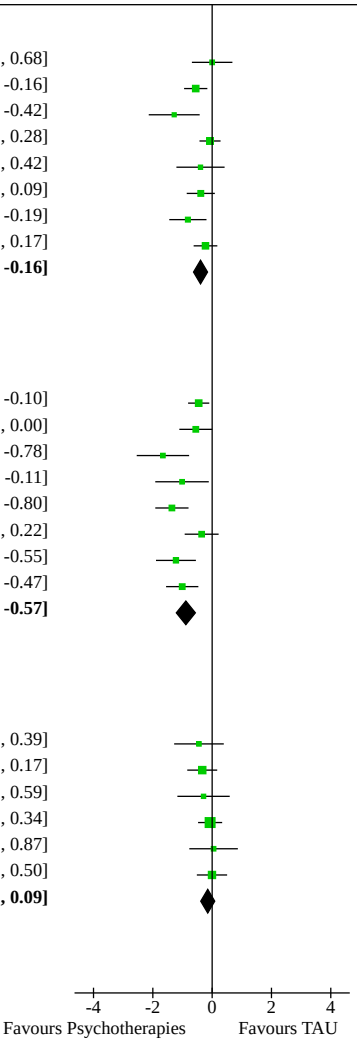
(1) Clinician rated: GAS
(2) GAS (CR)
(3) Self rated: SDS
(4) C-GAS (CR)
(5) Self reported: SAS-SR (higher scores indicate poorer functioning)
(6) CGI-global improvement, patient-rated (SR)
(7) Clinician rated: GAF
(8) WSAS (SR)
(9) BDQ-days out of role (SR)
(10) Self rated: SFQ
(11) Clinician-rated: GAF
(12) CORE-OM (SR)
(13) Clinician-rated: HoNOS
(14) OQ45, social role at discharge (SR)
(15) SAS-SR (SR)
(16) SPS - "How many days were you paid for working in the past 30 days?") (SR)

Comparison 29. Subgroup analysis: mode of therapy

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
29.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
29.1.1 Individual therapy	8	520	Std. Mean Difference (IV, Random, 95% CI)	-0.39 [-0.63, -0.16]
29.1.2 Group therapy	8	438	Std. Mean Difference (IV, Random, 95% CI)	-0.89 [-1.21, -0.57]
29.1.3 Mixed therapy	6	286	Std. Mean Difference (IV, Random, 95% CI)	-0.15 [-0.38, 0.09]
29.2 Psychosocial functioning	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
29.2.1 Individual therapy	8	570	Std. Mean Difference (IV, Random, 95% CI)	-0.31 [-0.75, 0.12]
29.2.2 Group therapy	7	366	Std. Mean Difference (IV, Random, 95% CI)	-0.44 [-0.65, -0.23]
29.2.3 Mixed therapy	7	378	Std. Mean Difference (IV, Random, 95% CI)	-0.63 [-1.14, -0.13]

Analysis 29.1. Comparison 29: Subgroup analysis: mode of therapy, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
29.1.1 Individual therapy								
Amianto 2011 (1)	3.3	1	16	3.3	1.1	17	8.8%	0.00 [-0.68 , 0.68]
Doering 2010 (2)	4.79	1.54	52	5.63	1.47	52	17.5%	-0.55 [-0.95 , -0.16]
Kredlow 2017a (3)	1.17	1.17	14	4.25	3.2	12	6.2%	-1.28 [-2.14 , -0.42]
Leichsenring 2016 (4)	18.76	8.6	64	19.41	9.38	58	19.2%	-0.07 [-0.43 , 0.28]
Philips 2018 (5)	17	9.1	13	20.7	9.1	11	6.8%	-0.39 [-1.20 , 0.42]
Priebe 2012 (6)	13.1	6.9	33	15.9	7.5	37	14.3%	-0.38 [-0.86 , 0.09]
Reneses 2013 (7)	13	7.9	18	19.1	6.9	26	10.0%	-0.82 [-1.45 , -0.19]
Schuppert 2012 (8)	13.29	9.53	48	15.39	9	49	17.2%	-0.22 [-0.62 , 0.17]
Subtotal (95% CI)			**258**			**262**	**100.0%**	**-0.39 [-0.63 , -0.16]**
Heterogeneity: Tau² = 0.04; Chi² = 11.44, df = 7 (P = 0.12); I² = 39%								
Test for overall effect: Z = 3.26 (P = 0.001)								
29.1.2 Group therapy								
Blum 2008 (9)	9.8	8.0623	65	13.4	7.6811	59	17.9%	-0.45 [-0.81 , -0.10]
Bos 2010 (10)	79.7	25.8	26	95.1	29.1	26	13.6%	-0.55 [-1.11 , 0.00]
Farrell 2009 (11)	18.81	9.47	16	32.75	5.9	12	8.4%	-1.66 [-2.54 , -0.78]
Gratz 2006 (12)	25.83	5.72	12	34.7	10.81	10	8.1%	-1.02 [-1.92 , -0.11]
Gratz 2014 (12)	27.47	6.59	31	35.88	5.59	30	13.5%	-1.36 [-1.92 , -0.80]
Leppänen 2016 (13)	17.54	10.14	19	21.48	11.41	32	13.3%	-0.35 [-0.93 , 0.22]
Morton 2012 (14)	32.76	12.47	21	47.42	11	20	11.4%	-1.22 [-1.89 , -0.55]
Soler 2009 (15)	3.5	1.2	29	4.44	0.52	30	13.8%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**219**			**219**	**100.0%**	**-0.89 [-1.21 , -0.57]**
Heterogeneity: Tau² = 0.12; Chi² = 16.44, df = 7 (P = 0.02); I² = 57%								
Test for overall effect: Z = 5.42 (P < 0.00001)								
29.1.3 Mixed therapy								
Gregory 2008b (12)	33.6	12.4	10	38.4	8.62	13	7.9%	-0.44 [-1.28 , 0.39]
Jørgensen 2013 (3)	2.8	2.5	42	3.6	2.1	24	21.7%	-0.33 [-0.84 , 0.17]
Koons 2001a (16)	3.6	1.6	10	4.2	2.3	10	7.1%	-0.29 [-1.17 , 0.59]
Laurenssen 2018 (17)	20.63	11.45	54	21.39	10.43	41	33.6%	-0.07 [-0.47 , 0.34]
Robinson 2016 (18)	9.64	7.41	12	9.27	7.39	11	8.3%	0.05 [-0.77 , 0.87]
Rossouw 2012b (19)	2.79	0.5385	29	3.06	65.7267	30	21.3%	-0.01 [-0.52 , 0.50]
Subtotal (95% CI)			**157**			**129**	**100.0%**	**-0.15 [-0.38 , 0.09]**
Heterogeneity: Tau² = 0.00; Chi² = 1.77, df = 5 (P = 0.88); I² = 0%								
Test for overall effect: Z = 1.24 (P = 0.22)								
Test for subgroup differences: Chi² = 13.23, df = 2 (P = 0.001), I² = 84.9%								

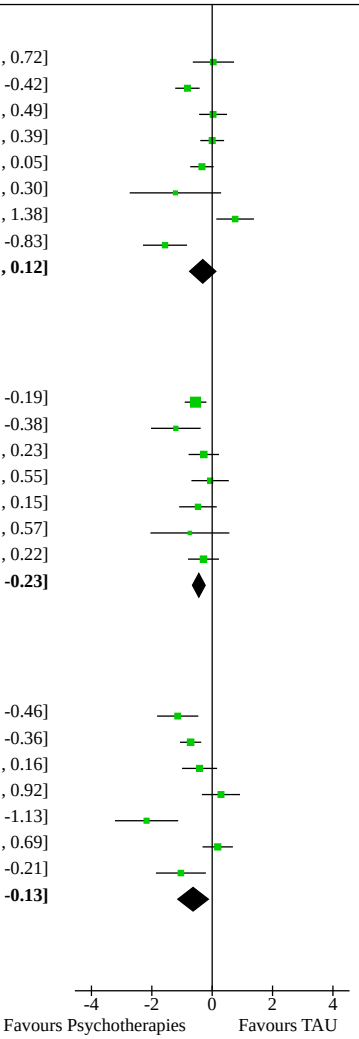


Footnotes

(1) Clinician rated: CGI-BPD
(2) Clinician-rated: Mean number of DSM-IV BPD criteria met
(3) SCID-BPD (CR)
(4) Self rated: Borderline Personality Inventory
(5) BPDSI-IV-total (CR)
(6) ZAN-BPD total (CR)
(7) Clinician rated: ZAN-BPD
(8) BPDSI-IV total
(9) Zan-BPD - total (CR)
(10) Self reported: BPD-40
(11) Self rated: BSI
(12) BEST (SR)
(13) Clinician-rated: BPDSI-IV
(14) Self rated: BEST
(15) CCGI-BPD global (CR)
(16) SCID-II - mean number of BPD criteria met (CR)
(17) BPDSI-IV (CR)
(18) Zan-BPD-total (CR)
(19) BPFS-C (SR)

Analysis 29.2. Comparison 29: Subgroup analysis: mode of therapy, Outcome 2: Psychosocial functioning

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
29.2.1 Individual therapy								
Amianto 2011 (1)	-65.9	11.2	16	-66.4	13	17	11.9%	0.04 [-0.64 , 0.72]
Andreoli 2016 (2)	-62.95	6.2343	140	-57.6	7.6	30	14.7%	-0.82 [-1.22 , -0.42]
Borschmann 2013 (3)	26.06	7.98	36	25.81	8.94	36	14.2%	0.03 [-0.43 , 0.49]
Davidson 2006 (4)	13.1	4.4	52	13.1	4.6	47	14.8%	0.00 [-0.39 , 0.39]
Doering 2010 (5)	-58.62	8.04	52	-56.06	6.87	52	14.9%	-0.34 [-0.73 , 0.05]
Gleeson 2012 (6)	-67	8.3	4	-50.6	14.1	5	5.5%	-1.22 [-2.73 , 0.30]
Reneses 2013 (7)	35.4	8.9	18	27.6	10.8	26	12.5%	0.76 [0.14 , 1.38]
Salzer 2014 (8)	-65	9.84	17	-51.82	6.82	22	11.4%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**335**			**235**	**100.0%**	**-0.31 [-0.75 , 0.12]**
Heterogeneity: Tau² = 0.29; Chi² = 35.46, df = 7 (P < 0.00001); I² = 80%								
Test for overall effect: Z = 1.42 (P = 0.16)								
29.2.2 Group therapy								
Blum 2008 (9)	-50.5	12.8996	65	-43.5	12.2898	59	34.0%	-0.55 [-0.91 , -0.19]
Farrell 2009 (1)	-60.5	10.17	16	-50.08	5.07	12	6.5%	-1.20 [-2.03 , -0.38]
Gratz 2014 (10)	14.25	6.24	31	16.01	6.24	30	17.3%	-0.28 [-0.78 , 0.23]
Jochems 2015 (11)	12.8	6.36	16	13.22	5.8	27	11.5%	-0.07 [-0.69 , 0.55]
Kramer 2016 (12)	12.76	7.79	21	16	5.42	20	11.4%	-0.47 [-1.09 , 0.15]
Mehlum 2014 (13)	-59.4	6.6	5	-54.2	6.1	5	2.6%	-0.74 [-2.05 , 0.57]
Soler 2009 (14)	3.27	0.9	29	3.57	1.13	30	16.7%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**183**			**183**	**100.0%**	**-0.44 [-0.65 , -0.23]**
Heterogeneity: Tau² = 0.00; Chi² = 6.01, df = 6 (P = 0.42); I² = 0%								
Test for overall effect: Z = 4.14 (P < 0.0001)								
29.2.3 Mixed therapy								
Bateman 1999 (15)	2.7	0.6	20	3.4	0.6	19	14.1%	-1.14 [-1.83 , -0.46]
Bateman 2009 (15)	1.76	0.5	71	2.17	0.64	63	17.3%	-0.72 [-1.07 , -0.36]
Carter 2010 (16)	8.15	11.48	20	13.07	11.59	28	15.1%	-0.42 [-1.00 , 0.16]
Feigenbaum 2012 (17)	2.48	0.85	25	2.22	0.92	16	14.6%	0.29 [-0.34 , 0.92]
Gregory 2008b (18)	-9.7	8.1	11	6.9	6.7	13	10.4%	-2.17 [-3.22 , -1.13]
Jørgensen 2013 (15)	2.2	0.5	42	2.1	0.6	24	15.9%	0.18 [-0.32 , 0.69]
Linehan 1994 (9)	-51.42	9.71	13	-40.43	10.8	13	12.5%	-1.04 [-1.86 , -0.21]
Subtotal (95% CI)			**202**			**176**	**100.0%**	**-0.63 [-1.14 , -0.13]**
Heterogeneity: Tau² = 0.35; Chi² = 29.46, df = 6 (P < 0.0001); I² = 80%								
Test for overall effect: Z = 2.46 (P = 0.01)								
Test for subgroup differences: Chi² = 0.89, df = 2 (P = 0.64), I² = 0%								



Footnotes

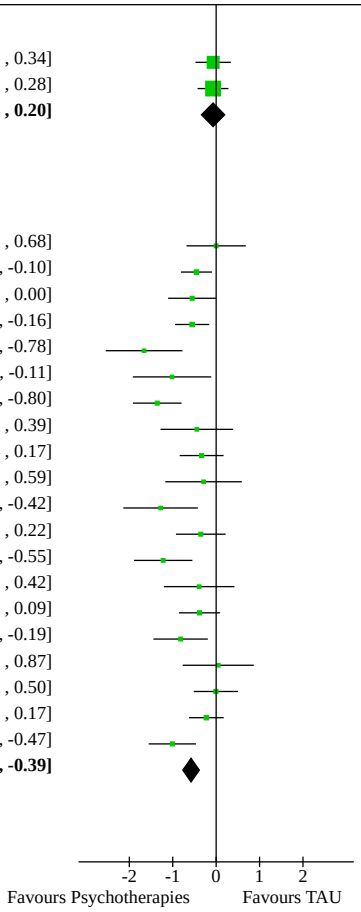
(1) Clinician rated: GAF
(2) Clinician rated: GAS
(3) WSAS (SR)
(4) Self rated: SFQ
(5) Clinician-rated: GAF
(6) SOFAS (CR)
(7) Self reported: SAS-SR (higher scores indicate poorer functioning)
(8) GAF (CR)
(9) GAS (CR)
(10) Self rated: SDS
(11) Clinician-rated: HoNOS
(12) OQ45, social role at discharge (SR)
(13) C-GAS (CR)
(14) CGI-global improvement, patient-rated (SR)
(15) SAS-SR (SR)
(16) BDQ-days out of role (SR)
(17) CORE-OM (SR)
(18) SPS - "How many days were you paid for working in the past 30 days?") (SR)

Comparison 30. Subgroup analysis: setting

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
30.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
30.1.1 Inpatient	2	217	Std. Mean Difference (IV, Random, 95% CI)	-0.07 [-0.34, 0.20]
30.1.2 Outpatient	20	1027	Std. Mean Difference (IV, Random, 95% CI)	-0.58 [-0.77, -0.39]
30.2 Psychosocial functioning	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
30.2.1 Inpatient	2	179	Std. Mean Difference (IV, Random, 95% CI)	-0.85 [-1.24, -0.46]
30.2.2 Outpatient	18	1057	Std. Mean Difference (IV, Random, 95% CI)	-0.31 [-0.54, -0.08]
30.2.3 Inpatient and outpatient	2	78	Std. Mean Difference (IV, Random, 95% CI)	-1.34 [-1.84, -0.84]

Analysis 30.1. Comparison 30: Subgroup analysis: setting, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
30.1.1 Inpatient								
Laurenssen 2018 (1)	20.63	11.45	54	21.39	10.43	41	43.4%	-0.07 [-0.47 , 0.34]
Leichsenring 2016 (2)	18.76	8.6	64	19.41	9.38	58	56.6%	-0.07 [-0.43 , 0.28]
Subtotal (95% CI)			**118**			**99**	**100.0%**	**-0.07 [-0.34 , 0.20]**
Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 0.99); I² = 0%								
Test for overall effect: Z = 0.52 (P = 0.61)								
30.1.2 Outpatient								
Amianto 2011 (3)	3.3	1	16	3.3	1.1	17	4.5%	0.00 [-0.68 , 0.68]
Blum 2008 (4)	9.8	8.0623	65	13.4	7.6811	59	7.7%	-0.45 [-0.81 , -0.10]
Bos 2010 (5)	79.7	25.8	26	95.1	29.1	26	5.5%	-0.55 [-1.11 , 0.00]
Doering 2010 (6)	4.79	1.54	52	5.63	1.47	52	7.3%	-0.55 [-0.95 , -0.16]
Farrell 2009 (7)	18.81	9.47	16	32.75	5.9	12	3.2%	-1.66 [-2.54 , -0.78]
Gratz 2006 (8)	25.83	5.72	12	34.7	10.81	10	3.1%	-1.02 [-1.92 , -0.11]
Gratz 2014 (8)	27.47	6.59	31	35.88	5.59	30	5.5%	-1.36 [-1.92 , -0.80]
Gregory 2008b (8)	33.6	12.4	10	38.4	8.62	13	3.5%	-0.44 [-1.28 , 0.39]
Jørgensen 2013 (9)	2.8	2.5	42	3.6	2.1	24	6.0%	-0.33 [-0.84 , 0.17]
Koons 2001a (10)	3.6	1.6	10	4.2	2.3	10	3.2%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (9)	1.17	1.17	14	4.25	3.2	12	3.3%	-1.28 [-2.14 , -0.42]
Leppänen 2016 (11)	17.54	10.14	19	21.48	11.41	32	5.4%	-0.35 [-0.93 , 0.22]
Morton 2012 (12)	32.76	12.47	21	47.42	11	20	4.5%	-1.22 [-1.89 , -0.55]
Philips 2018 (13)	17	9.1	13	20.7	9.1	11	3.6%	-0.39 [-1.20 , 0.42]
Priebe 2012 (14)	13.1	6.9	33	15.9	7.5	37	6.4%	-0.38 [-0.86 , 0.09]
Reneses 2013 (15)	13	7.9	18	19.1	6.9	26	4.9%	-0.82 [-1.45 , -0.19]
Robinson 2016 (16)	9.64	7.41	12	9.27	7.39	11	3.6%	0.05 [-0.77 , 0.87]
Rossouw 2012b (17)	2.79	0.5385	29	3.06	65.7267	30	6.0%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (18)	13.29	9.53	48	15.39	9	49	7.2%	-0.22 [-0.62 , 0.17]
Soler 2009 (19)	3.5	1.2	29	4.44	0.52	30	5.6%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**516**			**511**	**100.0%**	**-0.58 [-0.77 , -0.39]**
Heterogeneity: Tau² = 0.09; Chi² = 38.98, df = 19 (P = 0.004); I² = 51%								
Test for overall effect: Z = 5.95 (P < 0.00001)								
Test for subgroup differences: Chi² = 9.18, df = 1 (P = 0.002), I² = 89.1%								

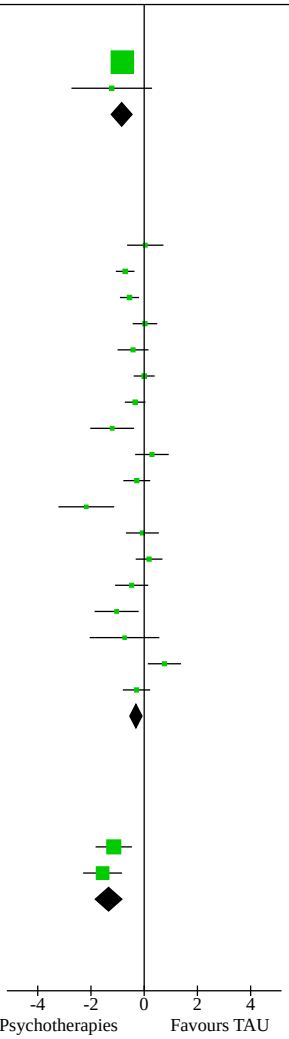


Footnotes

(1) BPDSI-IV (CR)
(2) Self rated: Borderline Personality Inventory
(3) Clinician rated: CGI-BPD
(4) Zan-BPD - total (CR)
(5) Self reported: BPD-40
(6) Clinician-rated: Mean number of DSM-IV BPD criteria met
(7) Self rated: BSI
(8) BEST (SR)
(9) SCID-BPD (CR)
(10) SCID-II - mean number of BPD criteria met (CR)
(11) Clinician-rated: BPDSI-IV
(12) Self rated: BEST
(13) BPDSI-IV-total (CR)
(14) ZAN-BPD total (CR)
(15) Clinician rated: ZAN-BPD
(16) Zan-BPD-total (CR)
(17) BPFS-C (SR)
(18) BPDSI-IV total
(19) CCGI-BPD global (CR)

Analysis 30.2. Comparison 30: Subgroup analysis: setting, Outcome 2: Psychosocial functioning

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
30.2.1 Inpatient								
Andreoli 2016 (1)	-62.95	6.2343	140	-57.6	7.6	30	93.4%	-0.82 [-1.22 , -0.42]
Gleeson 2012 (2)	-67	8.3	4	-50.6	14.1	5	6.6%	-1.22 [-2.73 , 0.30]
Subtotal (95% CI)			**144**			**35**	**100.0%**	**-0.85 [-1.24 , -0.46]**
Heterogeneity: Tau² = 0.00; Chi² = 0.25, df = 1 (P = 0.62); I² = 0%								
Test for overall effect: Z = 4.25 (P < 0.0001)								
30.2.2 Outpatient								
Amianto 2011 (3)	-65.9	11.2	16	-66.4	13	17	5.0%	0.04 [-0.64 , 0.72]
Bateman 2009 (4)	1.76	0.5	71	2.17	0.64	63	7.4%	-0.72 [-1.07 , -0.36]
Blum 2008 (5)	-50.5	12.8996	65	-43.5	12.2898	59	7.3%	-0.55 [-0.91 , -0.19]
Borschmann 2013 (6)	26.06	7.98	36	25.81	8.94	36	6.6%	0.03 [-0.43 , 0.49]
Carter 2010 (7)	8.15	11.48	20	13.07	11.59	28	5.7%	-0.42 [-1.00 , 0.16]
Davidson 2006 (8)	13.1	4.4	52	13.1	4.6	47	7.1%	0.00 [-0.39 , 0.39]
Doering 2010 (9)	-58.62	8.04	52	-56.06	6.87	52	7.1%	-0.34 [-0.73 , 0.05]
Farrell 2009 (3)	-60.5	10.17	16	-50.08	5.07	12	4.1%	-1.20 [-2.03 , -0.38]
Feigenbaum 2012 (10)	2.48	0.85	25	2.22	0.92	16	5.3%	0.29 [-0.34 , 0.92]
Gratz 2014 (11)	14.25	6.24	31	16.01	6.24	30	6.2%	-0.28 [-0.78 , 0.23]
Gregory 2008b (12)	-9.7	8.1	11	6.9	6.7	13	3.1%	-2.17 [-3.22 , -1.13]
Jochems 2015 (13)	12.8	6.36	16	13.22	5.8	27	5.4%	-0.07 [-0.69 , 0.55]
Jørgensen 2013 (4)	2.2	0.5	42	2.1	0.6	24	6.3%	0.18 [-0.32 , 0.69]
Kramer 2016 (14)	12.76	7.79	21	16	5.42	20	5.4%	-0.47 [-1.09 , 0.15]
Linehan 1994 (5)	-51.42	9.71	13	-40.43	10.8	13	4.1%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (15)	-59.4	6.6	5	-54.2	6.1	5	2.3%	-0.74 [-2.05 , 0.57]
Reneses 2013 (16)	35.4	8.9	18	27.6	10.8	26	5.4%	0.76 [0.14 , 1.38]
Soler 2009 (17)	3.27	0.9	29	3.57	1.13	30	6.2%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**539**			**518**	**100.0%**	**-0.31 [-0.54 , -0.08]**
Heterogeneity: Tau² = 0.15; Chi² = 51.90, df = 17 (P < 0.0001); I² = 67%								
Test for overall effect: Z = 2.67 (P = 0.008)								
30.2.3 Inpatient and outpatient								
Bateman 1999 (4)	2.7	0.6	20	3.4	0.6	19	53.4%	-1.14 [-1.83 , -0.46]
Salzer 2014 (18)	-65	9.84	17	-51.82	6.82	22	46.6%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**37**			**41**	**100.0%**	**-1.34 [-1.84 , -0.84]**
Heterogeneity: Tau² = 0.00; Chi² = 0.68, df = 1 (P = 0.41); I² = 0%								
Test for overall effect: Z = 5.26 (P < 0.00001)								
Test for subgroup differences: Chi² = 15.99, df = 2 (P = 0.0003), I² = 87.5%								



Footnotes

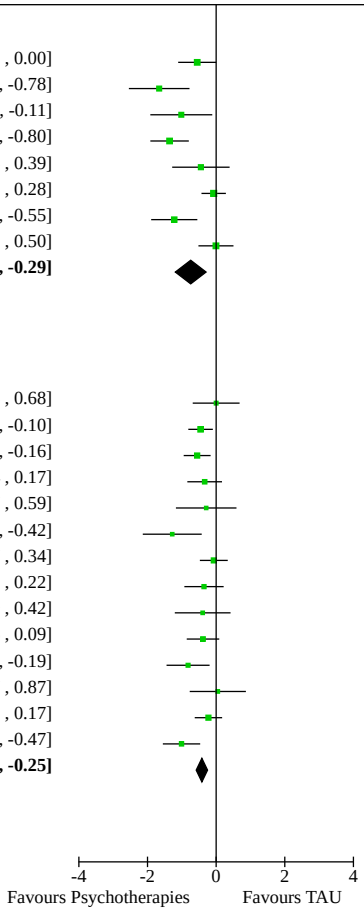
(1) Clinician rated: GAS
(2) SOFAS (CR)
(3) Clinician rated: GAF
(4) SAS-SR (SR)
(5) GAS (CR)
(6) WSAS (SR)
(7) BDQ-days out of role (SR)
(8) Self rated: SFQ
(9) Clinician-rated: GAF
(10) CORE-OM (SR)
(11) Self rated: SDS
(12) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(13) Clinician-rated: HoNOS
(14) OQ45, social role at discharge (SR)
(15) C-GAS (CR)
(16) Self reported: SAS-SR (higher scores indicate poorer functioning)
(17) CGI-global improvement, patient-rated (SR)
(18) GAF (CR)

Comparison 31. Subgroup analysis: types of raters

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
31.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
31.1.1 Self-rated	8	408	Std. Mean Difference (IV, Random, 95% CI)	-0.74 [-1.19, -0.29]
31.1.2 Clinician-rated	14	836	Std. Mean Difference (IV, Random, 95% CI)	-0.42 [-0.58, -0.25]
31.2 Psychosocial functioning	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
31.2.1 Self-rated	12	728	Std. Mean Difference (IV, Random, 95% CI)	-0.29 [-0.60, 0.03]
31.2.2 Clinician-rated	10	586	Std. Mean Difference (IV, Random, 95% CI)	-0.66 [-0.96, -0.37]

Analysis 31.1. Comparison 31: Subgroup analysis: types of raters, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
31.1.1 Self-rated								
Bos 2010 (1)	79.7	25.8	26	95.1	29.1	26	13.6%	-0.55 [-1.11 , 0.00]
Farrell 2009 (2)	18.81	9.47	16	32.75	5.9	12	10.3%	-1.66 [-2.54 , -0.78]
Gratz 2006 (3)	25.83	5.72	12	34.7	10.81	10	10.1%	-1.02 [-1.92 , -0.11]
Gratz 2014 (3)	27.47	6.59	31	35.88	5.59	30	13.5%	-1.36 [-1.92 , -0.80]
Gregory 2008b (3)	33.6	12.4	10	38.4	8.62	13	10.7%	-0.44 [-1.28 , 0.39]
Leichsenring 2016 (4)	18.76	8.6	64	19.41	9.38	58	15.5%	-0.07 [-0.43 , 0.28]
Morton 2012 (5)	32.76	12.47	21	47.42	11	20	12.4%	-1.22 [-1.89 , -0.55]
Rossouw 2012b (6)	2.79	0.5385	29	3.06	65.7267	30	14.0%	-0.01 [-0.52 , 0.50]
Subtotal (95% CI)			**209**			**199**	**100.0%**	**-0.74 [-1.19 , -0.29]**
Heterogeneity: Tau² = 0.30; Chi² = 30.26, df = 7 (P < 0.0001); I² = 77%								
Test for overall effect: Z = 3.25 (P = 0.001)								
31.1.2 Clinician-rated								
Amianto 2011 (7)	3.3	1	16	3.3	1.1	17	4.9%	0.00 [-0.68 , 0.68]
Blum 2008 (8)	9.8	8.0623	65	13.4	7.6811	59	12.6%	-0.45 [-0.81 , -0.10]
Doering 2010 (9)	4.79	1.54	52	5.63	1.47	52	11.2%	-0.55 [-0.95 , -0.16]
Jørgensen 2013 (10)	2.8	2.5	42	3.6	2.1	24	7.9%	-0.33 [-0.84 , 0.17]
Koons 2001a (11)	3.6	1.6	10	4.2	2.3	10	3.1%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (10)	1.17	1.17	14	4.25	3.2	12	3.3%	-1.28 [-2.14 , -0.42]
Laurenssen 2018 (12)	20.63	11.45	54	21.39	10.43	41	10.7%	-0.07 [-0.47 , 0.34]
Leppänen 2016 (13)	17.54	10.14	19	21.48	11.41	32	6.5%	-0.35 [-0.93 , 0.22]
Philips 2018 (14)	17	9.1	13	20.7	9.1	11	3.6%	-0.39 [-1.20 , 0.42]
Priebe 2012 (15)	13.1	6.9	33	15.9	7.5	37	8.7%	-0.38 [-0.86 , 0.09]
Reneses 2013 (16)	13	7.9	18	19.1	6.9	26	5.6%	-0.82 [-1.45 , -0.19]
Robinson 2016 (17)	9.64	7.41	12	9.27	7.39	11	3.6%	0.05 [-0.77 , 0.87]
Schuppert 2012 (18)	13.29	9.53	48	15.39	9	49	11.0%	-0.22 [-0.62 , 0.17]
Soler 2009 (19)	3.5	1.2	29	4.44	0.52	30	7.1%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**425**			**411**	**100.0%**	**-0.42 [-0.58 , -0.25]**
Heterogeneity: Tau² = 0.02; Chi² = 17.14, df = 13 (P = 0.19); I² = 24%								
Test for overall effect: Z = 4.94 (P < 0.00001)								
Test for subgroup differences: Chi² = 1.79, df = 1 (P = 0.18), I² = 44.2%								

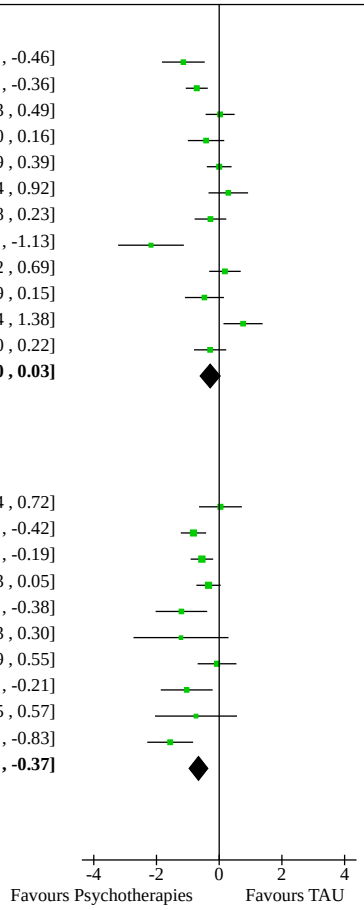


Footnotes

(1) Self reported: BPD-40
(2) Self rated: BSI
(3) BEST (SR)
(4) Self rated: Borderline Personality Inventory
(5) Self rated: BEST
(6) BPFS-C (SR)
(7) Clinician rated: CGI-BPD
(8) Zan-BPD - total (CR)
(9) Clinician-rated: Mean number of DSM-IV BPD criteria met
(10) SCID-BPD (CR)
(11) SCID-II - mean number of BPD criteria met (CR)
(12) BPDSI-IV (CR)
(13) Clinician-rated: BPDSI-IV
(14) BPDSI-IV-total (CR)
(15) ZAN-BPD total (CR)
(16) Clinician rated: ZAN-BPD
(17) Zan-BPD-total (CR)
(18) BPDSI-IV total
(19) CCGI-BPD global (CR)

Analysis 31.2. Comparison 31: Subgroup analysis: types of raters, Outcome 2: Psychosocial functioning

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
31.2.1 Self-rated								
Bateman 1999 (1)	2.7	0.6	20	3.4	0.6	19	7.5%	-1.14 [-1.83 , -0.46]
Bateman 2009 (1)	1.76	0.5	71	2.17	0.64	63	10.0%	-0.72 [-1.07 , -0.36]
Borschmann 2013 (2)	26.06	7.98	36	25.81	8.94	36	9.2%	0.03 [-0.43 , 0.49]
Carter 2010 (3)	8.15	11.48	20	13.07	11.59	28	8.3%	-0.42 [-1.00 , 0.16]
Davidson 2006 (4)	13.1	4.4	52	13.1	4.6	47	9.7%	0.00 [-0.39 , 0.39]
Feigenbaum 2012 (5)	2.48	0.85	25	2.22	0.92	16	7.9%	0.29 [-0.34 , 0.92]
Gratz 2014 (6)	14.25	6.24	31	16.01	6.24	30	8.9%	-0.28 [-0.78 , 0.23]
Gregory 2008b (7)	-9.7	8.1	11	6.9	6.7	13	5.1%	-2.17 [-3.22 , -1.13]
Jørgensen 2013 (1)	2.2	0.5	42	2.1	0.6	24	8.9%	0.18 [-0.32 , 0.69]
Kramer 2016 (8)	12.76	7.79	21	16	5.42	20	7.9%	-0.47 [-1.09 , 0.15]
Reneses 2013 (9)	35.4	8.9	18	27.6	10.8	26	7.9%	0.76 [0.14 , 1.38]
Soler 2009 (10)	3.27	0.9	29	3.57	1.13	30	8.8%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**376**			**352**	**100.0%**	**-0.29 [-0.60 , 0.03]**
Heterogeneity: Tau² = 0.23; Chi² = 45.87, df = 11 (P < 0.00001); I² = 76%								
Test for overall effect: Z = 1.78 (P = 0.07)								
31.2.2 Clinician-rated								
Amianto 2011 (11)	-65.9	11.2	16	-66.4	13	17	9.9%	0.04 [-0.64 , 0.72]
Andreoli 2016 (12)	-62.95	6.2343	140	-57.6	7.6	30	15.1%	-0.82 [-1.22 , -0.42]
Blum 2008 (13)	-50.5	12.8996	65	-43.5	12.2898	59	16.1%	-0.55 [-0.91 , -0.19]
Doering 2010 (14)	-58.62	8.04	52	-56.06	6.87	52	15.5%	-0.34 [-0.73 , 0.05]
Farrell 2009 (11)	-60.5	10.17	16	-50.08	5.07	12	8.0%	-1.20 [-2.03 , -0.38]
Gleeson 2012 (15)	-67	8.3	4	-50.6	14.1	5	3.2%	-1.22 [-2.73 , 0.30]
Jochems 2015 (16)	12.8	6.36	16	13.22	5.8	27	10.9%	-0.07 [-0.69 , 0.55]
Linehan 1994 (13)	-51.42	9.71	13	-40.43	10.8	13	7.9%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (17)	-59.4	6.6	5	-54.2	6.1	5	4.1%	-0.74 [-2.05 , 0.57]
Salzer 2014 (18)	-65	9.84	17	-51.82	6.82	22	9.2%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**344**			**242**	**100.0%**	**-0.66 [-0.96 , -0.37]**
Heterogeneity: Tau² = 0.11; Chi² = 19.65, df = 9 (P = 0.02); I² = 54%								
Test for overall effect: Z = 4.39 (P < 0.0001)								
Test for subgroup differences: Chi² = 2.86, df = 1 (P = 0.09), I² = 65.1%								



Footnotes

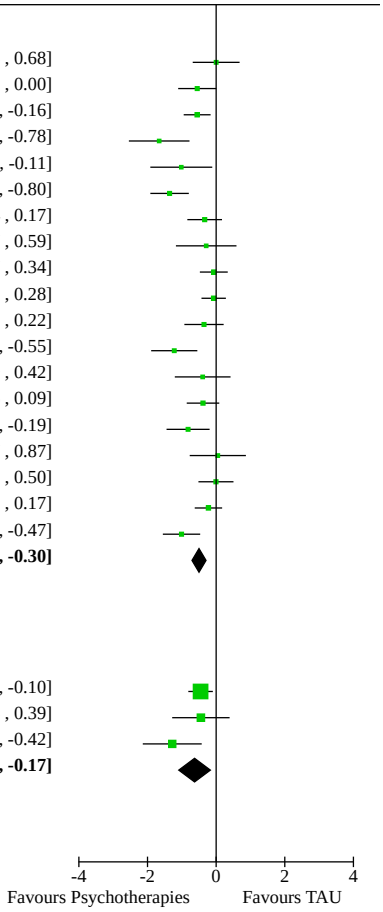
(1) SAS-SR (SR)
(2) WSAS (SR)
(3) BDQ-days out of role (SR)
(4) Self rated: SFQ
(5) CORE-OM (SR)
(6) Self rated: SDS
(7) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(8) OQ45, social role at discharge (SR)
(9) Self reported: SAS-SR (higher scores indicate poorer functioning)
(10) CGI-global improvement, patient-rated (SR)
(11) Clinician rated: GAF
(12) Clinician rated: GAS
(13) GAS (CR)
(14) Clinician-rated: GAF
(15) SOFAS (CR)
(16) Clinician-rated: HoNOS
(17) C-GAS (CR)
(18) GAF (CR)

Comparison 32. Subgroup analysis: types of TAU

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
32.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
32.1.1 Obligatory TAU	19	1071	Std. Mean Difference (IV, Random, 95% CI)	-0.50 [-0.70, -0.30]
32.1.2 Optional TAU	3	173	Std. Mean Difference (IV, Random, 95% CI)	-0.63 [-1.09, -0.17]
32.2 Psychosocial functioning	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
32.2.1 Obligatory TAU	17	1002	Std. Mean Difference (IV, Random, 95% CI)	-0.32 [-0.56, -0.09]
32.2.2 Optional TAU	5	312	Std. Mean Difference (IV, Random, 95% CI)	-0.96 [-1.62, -0.30]

Analysis 32.1. Comparison 32: Subgroup analysis: types of TAU, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
32.1.1 Obligatory TAU								
Amianto 2011 (1)	3.3	1	16	3.3	1.1	17	4.6%	0.00 [-0.68 , 0.68]
Bos 2010 (2)	79.7	25.8	26	95.1	29.1	26	5.5%	-0.55 [-1.11 , 0.00]
Doering 2010 (3)	4.79	1.54	52	5.63	1.47	52	7.0%	-0.55 [-0.95 , -0.16]
Farrell 2009 (4)	18.81	9.47	16	32.75	5.9	12	3.4%	-1.66 [-2.54 , -0.78]
Gratz 2006 (5)	25.83	5.72	12	34.7	10.81	10	3.3%	-1.02 [-1.92 , -0.11]
Gratz 2014 (5)	27.47	6.59	31	35.88	5.59	30	5.5%	-1.36 [-1.92 , -0.80]
Jørgensen 2013 (6)	2.8	2.5	42	3.6	2.1	24	6.0%	-0.33 [-0.84 , 0.17]
Koons 2001a (7)	3.6	1.6	10	4.2	2.3	10	3.4%	-0.29 [-1.17 , 0.59]
Laurenssen 2018 (8)	20.63	11.45	54	21.39	10.43	41	6.8%	-0.07 [-0.47 , 0.34]
Leichsenring 2016 (9)	18.76	8.6	64	19.41	9.38	58	7.3%	-0.07 [-0.43 , 0.28]
Leppänen 2016 (10)	17.54	10.14	19	21.48	11.41	32	5.4%	-0.35 [-0.93 , 0.22]
Morton 2012 (11)	32.76	12.47	21	47.42	11	20	4.6%	-1.22 [-1.89 , -0.55]
Philips 2018 (12)	17	9.1	13	20.7	9.1	11	3.8%	-0.39 [-1.20 , 0.42]
Priebe 2012 (13)	13.1	6.9	33	15.9	7.5	37	6.2%	-0.38 [-0.86 , 0.09]
Reneses 2013 (14)	13	7.9	18	19.1	6.9	26	5.0%	-0.82 [-1.45 , -0.19]
Robinson 2016 (15)	9.64	7.41	12	9.27	7.39	11	3.7%	0.05 [-0.77 , 0.87]
Rossouw 2012b (16)	2.79	0.5385	29	3.06	65.7267	30	5.9%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (17)	13.29	9.53	48	15.39	9	49	6.9%	-0.22 [-0.62 , 0.17]
Soler 2009 (18)	3.5	1.2	29	4.44	0.52	30	5.6%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**545**			**526**	**100.0%**	**-0.50 [-0.70 , -0.30]**
Heterogeneity: Tau² = 0.12; Chi² = 45.07, df = 18 (P = 0.0004); I² = 60%								
Test for overall effect: Z = 4.80 (P < 0.00001)								
32.1.2 Optional TAU								
Blum 2008 (19)	9.8	8.0623	65	13.4	7.6811	59	56.3%	-0.45 [-0.81 , -0.10]
Gregory 2008b (5)	33.6	12.4	10	38.4	8.62	13	22.3%	-0.44 [-1.28 , 0.39]
Kredlow 2017a (6)	1.17	1.17	14	4.25	3.2	12	21.4%	-1.28 [-2.14 , -0.42]
Subtotal (95% CI)			**89**			**84**	**100.0%**	**-0.63 [-1.09 , -0.17]**
Heterogeneity: Tau² = 0.06; Chi² = 3.11, df = 2 (P = 0.21); I² = 36%								
Test for overall effect: Z = 2.68 (P = 0.007)								
Test for subgroup differences: Chi² = 0.25, df = 1 (P = 0.61), I² = 0%								

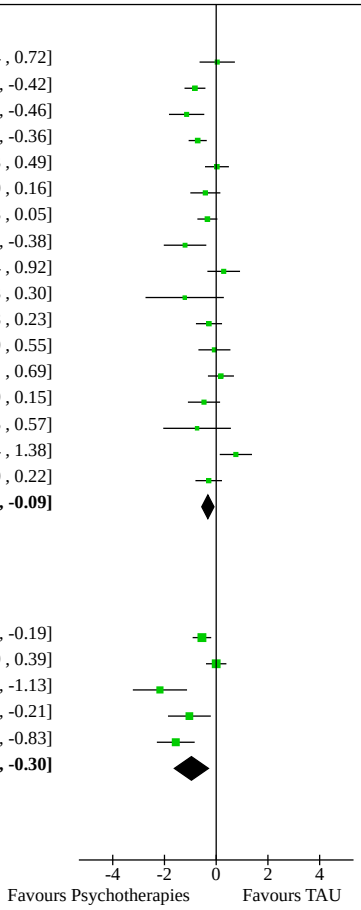


Footnotes

(1) Clinician rated: CGI-BPD
(2) Self reported: BPD-40
(3) Clinician-rated: Mean number of DSM-IV BPD criteria met
(4) Self rated: BSI
(5) BEST (SR)
(6) SCID-BPD (CR)
(7) SCID-II - mean number of BPD criteria met (CR)
(8) BPDSI-IV (CR)
(9) Self rated: Borderline Personality Inventory
(10) Clinician-rated: BPDSI-IV
(11) Self rated: BEST
(12) BPDSI-IV-total (CR)
(13) ZAN-BPD total (CR)
(14) Clinician rated: ZAN-BPD
(15) Zan-BPD-total (CR)
(16) BPFS-C (SR)
(17) BPDSI-IV total
(18) CCGI-BPD global (CR)
(19) Zan-BPD - total (CR)

Analysis 32.2. Comparison 32: Subgroup analysis: types of TAU, Outcome 2: Psychosocial functioning

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
32.2.1 Obligatory TAU								
Amianto 2011 (1)	-65.9	11.2	16	-66.4	13	17	5.4%	0.04 [-0.64 , 0.72]
Andreoli 2016 (2)	-62.95	6.2343	140	-57.6	7.6	30	7.6%	-0.82 [-1.22 , -0.42]
Bateman 1999 (3)	2.7	0.6	20	3.4	0.6	19	5.4%	-1.14 [-1.83 , -0.46]
Bateman 2009 (3)	1.76	0.5	71	2.17	0.64	63	8.1%	-0.72 [-1.07 , -0.36]
Borschmann 2013 (4)	26.06	7.98	36	25.81	8.94	36	7.1%	0.03 [-0.43 , 0.49]
Carter 2010 (5)	8.15	11.48	20	13.07	11.59	28	6.2%	-0.42 [-1.00 , 0.16]
Doering 2010 (6)	-58.62	8.04	52	-56.06	6.87	52	7.8%	-0.34 [-0.73 , 0.05]
Farrell 2009 (1)	-60.5	10.17	16	-50.08	5.07	12	4.5%	-1.20 [-2.03 , -0.38]
Feigenbaum 2012 (7)	2.48	0.85	25	2.22	0.92	16	5.8%	0.29 [-0.34 , 0.92]
Gleeson 2012 (8)	-67	8.3	4	-50.6	14.1	5	1.9%	-1.22 [-2.73 , 0.30]
Gratz 2014 (9)	14.25	6.24	31	16.01	6.24	30	6.8%	-0.28 [-0.78 , 0.23]
Jochems 2015 (10)	12.8	6.36	16	13.22	5.8	27	5.9%	-0.07 [-0.69 , 0.55]
Jørgensen 2013 (3)	2.2	0.5	42	2.1	0.6	24	6.8%	0.18 [-0.32 , 0.69]
Kramer 2016 (11)	12.76	7.79	21	16	5.42	20	5.8%	-0.47 [-1.09 , 0.15]
Mehlum 2014 (12)	-59.4	6.6	5	-54.2	6.1	5	2.4%	-0.74 [-2.05 , 0.57]
Reneses 2013 (13)	35.4	8.9	18	27.6	10.8	26	5.8%	0.76 [0.14 , 1.38]
Soler 2009 (14)	3.27	0.9	29	3.57	1.13	30	6.7%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**562**			**440**	**100.0%**	**-0.32 [-0.56 , -0.09]**
Heterogeneity: Tau² = 0.15; Chi² = 45.74, df = 16 (P = 0.0001); I² = 65%								
Test for overall effect: Z = 2.68 (P = 0.007)								
32.2.2 Optional TAU								
Blum 2008 (15)	-50.5	12.8996	65	-43.5	12.2898	59	23.7%	-0.55 [-0.91 , -0.19]
Davidson 2006 (16)	13.1	4.4	52	13.1	4.6	47	23.3%	0.00 [-0.39 , 0.39]
Gregory 2008b (17)	-9.7	8.1	11	6.9	6.7	13	15.5%	-2.17 [-3.22 , -1.13]
Linehan 1994 (15)	-51.42	9.71	13	-40.43	10.8	13	18.2%	-1.04 [-1.86 , -0.21]
Salzer 2014 (18)	-65	9.84	17	-51.82	6.82	22	19.4%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**158**			**154**	**100.0%**	**-0.96 [-1.62 , -0.30]**
Heterogeneity: Tau² = 0.44; Chi² = 25.34, df = 4 (P < 0.0001); I² = 84%								
Test for overall effect: Z = 2.85 (P = 0.004)								
Test for subgroup differences: Chi² = 3.18, df = 1 (P = 0.07), I² = 68.6%								



Footnotes

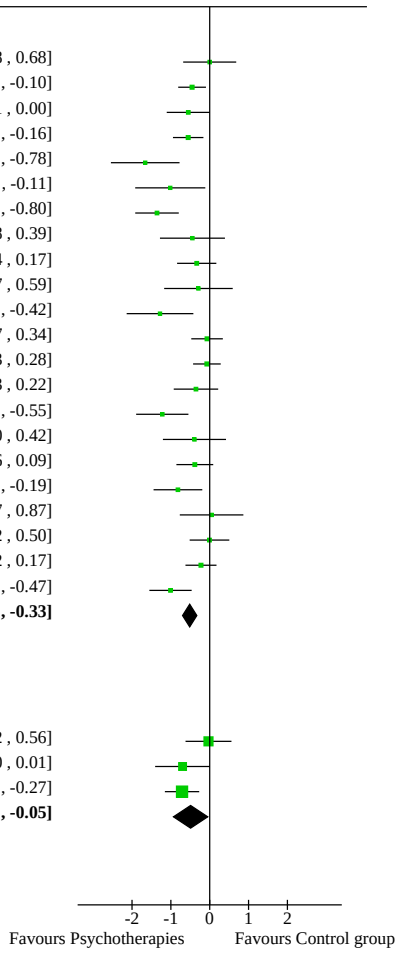
(1) Clinician rated: GAF
(2) Clinician rated: GAS
(3) SAS-SR (SR)
(4) WSAS (SR)
(5) BDQ-days out of role (SR)
(6) Clinician-rated: GAF
(7) CORE-OM (SR)
(8) SOFAS (CR)
(9) Self rated: SDS
(10) Clinician-rated: HoNOS
(11) OQ45, social role at discharge (SR)
(12) C-GAS (CR)
(13) Self reported: SAS-SR (higher scores indicate poorer functioning)
(14) CGI-global improvement, patient-rated (SR)
(15) GAS (CR)
(16) Self rated: SFQ
(17) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(18) GAF (CR)

Comparison 33. Subgroup analysis: type of comparison group

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
33.1 BPD symptom severity	25		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
33.1.1 TAU	22	1244	Std. Mean Difference (IV, Random, 95% CI)	-0.52 [-0.70, -0.33]
33.1.2 Waiting list	3	161	Std. Mean Difference (IV, Random, 95% CI)	-0.49 [-0.93, -0.05]
33.2 Psychosocial functioning	27		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
33.2.1 TAU	22	1314	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-0.68, -0.22]
33.2.2 Waiting list	5	219	Std. Mean Difference (IV, Random, 95% CI)	-0.56 [-1.01, -0.11]

Analysis 33.1. Comparison 33: Subgroup analysis: type of comparison group, Outcome 1: BPD symptom severity

Study or Subgroup	Psychotherapies Mean	SD	Total	Control group Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
33.1.1 TAU								
Amianto 2011 (1)	3.3	1	16	3.3	1.1	17	3.9%	0.00 [-0.68 , 0.68]
Blum 2008 (2)	9.8	8.0623	65	13.4	7.6811	59	6.5%	-0.45 [-0.81 , -0.10]
Bos 2010 (3)	79.7	25.8	26	95.1	29.1	26	4.8%	-0.55 [-1.11 , 0.00]
Doering 2010 (4)	4.79	1.54	52	5.63	1.47	52	6.2%	-0.55 [-0.95 , -0.16]
Farrell 2009 (5)	18.81	9.47	16	32.75	5.9	12	2.9%	-1.66 [-2.54 , -0.78]
Gratz 2006 (6)	25.83	5.72	12	34.7	10.81	10	2.8%	-1.02 [-1.92 , -0.11]
Gratz 2014 (6)	27.47	6.59	31	35.88	5.59	30	4.8%	-1.36 [-1.92 , -0.80]
Gregory 2008b (6)	33.6	12.4	10	38.4	8.62	13	3.1%	-0.44 [-1.28 , 0.39]
Jørgensen 2013 (7)	2.8	2.5	42	3.6	2.1	24	5.2%	-0.33 [-0.84 , 0.17]
Koons 2001a (8)	3.6	1.6	10	4.2	2.3	10	2.9%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (7)	1.17	1.17	14	4.25	3.2	12	3.0%	-1.28 [-2.14 , -0.42]
Laurenssen 2018 (9)	20.63	11.45	54	21.39	10.43	41	6.1%	-0.07 [-0.47 , 0.34]
Leichsenring 2016 (10)	18.76	8.6	64	19.41	9.38	58	6.5%	-0.07 [-0.43 , 0.28]
Leppänen 2016 (11)	17.54	10.14	19	21.48	11.41	32	4.7%	-0.35 [-0.93 , 0.22]
Morton 2012 (12)	32.76	12.47	21	47.42	11	20	4.0%	-1.22 [-1.89 , -0.55]
Philips 2018 (13)	17	9.1	13	20.7	9.1	11	3.2%	-0.39 [-1.20 , 0.42]
Priebe 2012 (14)	13.1	6.9	33	15.9	7.5	37	5.5%	-0.38 [-0.86 , 0.09]
Reneses 2013 (15)	13	7.9	18	19.1	6.9	26	4.3%	-0.82 [-1.45 , -0.19]
Robinson 2016 (16)	9.64	7.41	12	9.27	7.39	11	3.2%	0.05 [-0.77 , 0.87]
Rossouw 2012b (17)	2.79	0.5385	29	3.06	65.7267	30	5.2%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (18)	13.29	9.53	48	15.39	9	49	6.1%	-0.22 [-0.62 , 0.17]
Soler 2009 (19)	3.5	1.2	29	4.44	0.52	30	4.9%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**634**			**610**	**100.0%**	**-0.52 [-0.70 , -0.33]**
Heterogeneity: Tau² = 0.10; Chi² = 48.68, df = 21 (P = 0.0006); I² = 57%								
Test for overall effect: Z = 5.51 (P < 0.00001)								
33.1.2 Waiting list								
Bellino 2010 (20)	33.27	5.96	22	33.46	5.95	22	31.8%	-0.03 [-0.62 , 0.56]
Bohus 2013 (21)	3.24	2.14	17	4.62	1.67	16	25.6%	-0.70 [-1.40 , 0.01]
McMain 2017 (22)	33.72	18.7	42	48.48	22.21	42	42.6%	-0.71 [-1.15 , -0.27]
Subtotal (95% CI)			**81**			**80**	**100.0%**	**-0.49 [-0.93 , -0.05]**
Heterogeneity: Tau² = 0.07; Chi² = 3.60, df = 2 (P = 0.17); I² = 44%								
Test for overall effect: Z = 2.19 (P = 0.03)								
Test for subgroup differences: Chi² = 0.01, df = 1 (P = 0.92), I² = 0%								

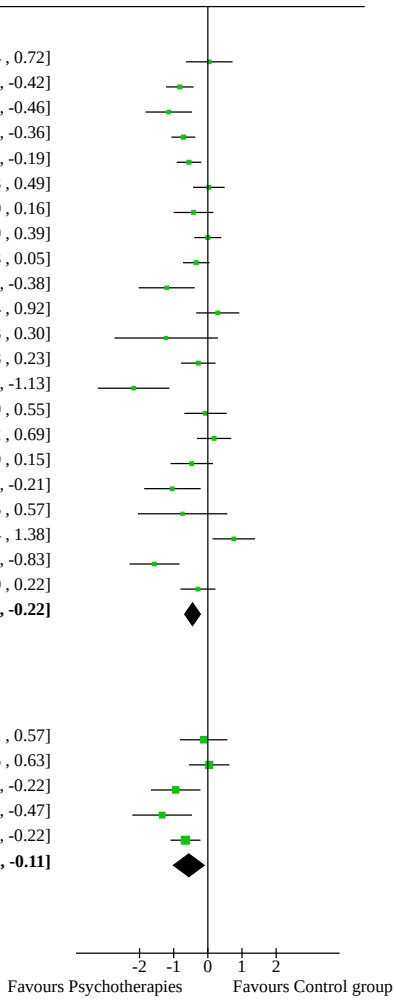


Footnotes

(1) Clinician rated: CGI-BPD
(2) Zan-BPD - total (CR)
(3) Self reported: BPD-40
(4) Clinician-rated: Mean number of DSM-IV BPD criteria met
(5) Self rated: BSI
(6) BEST (SR)
(7) SCID-BPD (CR)
(8) SCID-II - mean number of BPD criteria met (CR)
(9) BPDSI-IV (CR)
(10) Self rated: Borderline Personality Inventory
(11) Clinician-rated: BPDSI-IV
(12) Self rated: BEST
(13) BPDSI-IV-total (CR)
(14) ZAN-BPD total (CR)
(15) Clinician rated: ZAN-BPD
(16) Zan-BPD-total (CR)
(17) BPFS-C (SR)
(18) BPDSI-IV total
(19) CCGI-BPD global (CR)
(20) Clinician rated: BPDSI-IV
(21) IPDE-BPD criteria (CR)
(22) Self rated: BSL

Analysis 33.2. Comparison 33: Subgroup analysis: type of comparison group, Outcome 2: Psychosocial functioning

Study or Subgroup	Psychotherapies Mean	SD	Total	Control group Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
33.2.1 TAU								
Amianto 2011 (1)	-65.9	11.2	16	-66.4	13	17	4.3%	0.04 [-0.64 , 0.72]
Andreoli 2016 (2)	-62.95	6.2343	140	-57.6	7.6	30	5.7%	-0.82 [-1.22 , -0.42]
Bateman 1999 (3)	2.7	0.6	20	3.4	0.6	19	4.3%	-1.14 [-1.83 , -0.46]
Bateman 2009 (3)	1.76	0.5	71	2.17	0.64	63	6.0%	-0.72 [-1.07 , -0.36]
Blum 2008 (4)	-50.5	12.8996	65	-43.5	12.2898	59	5.9%	-0.55 [-0.91 , -0.19]
Borschmann 2013 (5)	26.06	7.98	36	25.81	8.94	36	5.4%	0.03 [-0.43 , 0.49]
Carter 2010 (6)	8.15	11.48	20	13.07	11.59	28	4.8%	-0.42 [-1.00 , 0.16]
Davidson 2006 (7)	13.1	4.4	52	13.1	4.6	47	5.8%	0.00 [-0.39 , 0.39]
Doering 2010 (8)	-58.62	8.04	52	-56.06	6.87	52	5.8%	-0.34 [-0.73 , 0.05]
Farrell 2009 (1)	-60.5	10.17	16	-50.08	5.07	12	3.7%	-1.20 [-2.03 , -0.38]
Feigenbaum 2012 (9)	2.48	0.85	25	2.22	0.92	16	4.6%	0.29 [-0.34 , 0.92]
Gleeson 2012 (10)	-67	8.3	4	-50.6	14.1	5	1.7%	-1.22 [-2.73 , 0.30]
Gratz 2014 (11)	14.25	6.24	31	16.01	6.24	30	5.2%	-0.28 [-0.78 , 0.23]
Gregory 2008b (12)	-9.7	8.1	11	6.9	6.7	13	2.8%	-2.17 [-3.22 , -1.13]
Jochems 2015 (13)	12.8	6.36	16	13.22	5.8	27	4.6%	-0.07 [-0.69 , 0.55]
Jørgensen 2013 (3)	2.2	0.5	42	2.1	0.6	24	5.2%	0.18 [-0.32 , 0.69]
Kramer 2016 (14)	12.76	7.79	21	16	5.42	20	4.6%	-0.47 [-1.09 , 0.15]
Linehan 1994 (4)	-51.42	9.71	13	-40.43	10.8	13	3.6%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (15)	-59.4	6.6	5	-54.2	6.1	5	2.1%	-0.74 [-2.05 , 0.57]
Reneses 2013 (16)	35.4	8.9	18	27.6	10.8	26	4.6%	0.76 [0.14 , 1.38]
Salzer 2014 (17)	-65	9.84	17	-51.82	6.82	22	4.1%	-1.56 [-2.29 , -0.83]
Soler 2009 (18)	3.27	0.9	29	3.57	1.13	30	5.2%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**720**			**594**	**100.0%**	**-0.45 [-0.68 , -0.22]**
Heterogeneity: Tau² = 0.20; Chi² = 74.18, df = 21 (P < 0.00001); I² = 72%								
Test for overall effect: Z = 3.84 (P = 0.0001)								
33.2.2 Waiting list								
Bellino 2006 (19)	2.9	0.9	16	3	0.7	16	19.0%	-0.12 [-0.81 , 0.57]
Bellino 2010 (20)	4.37	0.49	22	4.35	0.48	22	21.7%	0.04 [-0.55 , 0.63]
Bohus 2013 (1)	-47.88	7.8	17	-40.88	6.64	16	18.2%	-0.94 [-1.66 , -0.22]
Haeyen 2018 (21)	46.27	9.77	15	64.91	17.42	11	15.0%	-1.34 [-2.21 , -0.47]
McMain 2017 (22)	2.5	0.56	42	2.88	0.59	42	26.1%	-0.65 [-1.09 , -0.22]
Subtotal (95% CI)			**112**			**107**	**100.0%**	**-0.56 [-1.01 , -0.11]**
Heterogeneity: Tau² = 0.15; Chi² = 9.75, df = 4 (P = 0.04); I² = 59%								
Test for overall effect: Z = 2.44 (P = 0.01)								
Test for subgroup differences: Chi² = 0.18, df = 1 (P = 0.67), I² = 0%								



Footnotes

(1) Clinician rated: GAF
(2) Clinician rated: GAS
(3) SAS-SR (SR)
(4) GAS (CR)
(5) WSAS (SR)
(6) BDQ-days out of role (SR)
(7) Self rated: SFQ
(8) Clinician-rated: GAF
(9) CORE-OM (SR)
(10) SOFAS (CR)
(11) Self rated: SDS
(12) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(13) Clinician-rated: HoNOS
(14) OQ45, social role at discharge (SR)
(15) C-GAS (CR)
(16) Self reported: SAS-SR (higher scores indicate poorer functioning)
(17) GAF (CR)
(18) CGI-global improvement, patient-rated (SR)
(19) Clinician rated: CGI-S
(20) Observer rated:CGI-S
(21) Self reported: OQ45, total score
(22) Self rated: SAS-SR

Analysis 33.2. (Continued)

(21) Self reported: OQ45, total score
(22) Self rated: SAS-SR

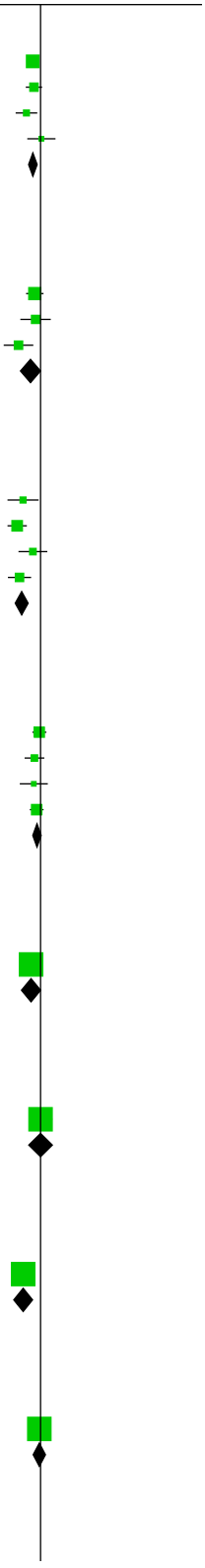
Comparison 34. Subgroup analysis: types of scales

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
34.1 BPD symptom severity	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
34.1.1 ZAN-BPD	4	261	Std. Mean Difference (IV, Random, 95% CI)	-0.45 [-0.69, -0.20]
34.1.2 SCID	3	112	Std. Mean Difference (IV, Random, 95% CI)	-0.58 [-1.16, -0.00]
34.1.3 BEST	4	147	Std. Mean Difference (IV, Random, 95% CI)	-1.10 [-1.47, -0.72]
34.1.4 BPDSI	4	267	Std. Mean Difference (IV, Random, 95% CI)	-0.21 [-0.45, 0.04]
34.1.5 BPP-40	1	52	Std. Mean Difference (IV, Random, 95% CI)	-0.55 [-1.11, 0.00]
34.1.6 CGI-BPD	1	33	Std. Mean Difference (IV, Random, 95% CI)	0.00 [-0.68, 0.68]
34.1.7 CCGI-BPD	1	59	Std. Mean Difference (IV, Random, 95% CI)	-1.01 [-1.55, -0.47]
34.1.8 BPT	1	122	Std. Mean Difference (IV, Random, 95% CI)	-0.07 [-0.43, 0.28]
34.1.9 BPFS-C	1	59	Std. Mean Difference (IV, Random, 95% CI)	-0.01 [-0.52, 0.50]
34.1.10 BSI	1	28	Std. Mean Difference (IV, Random, 95% CI)	-1.66 [-2.54, -0.78]
34.1.11 Mean number of DSM-IV symptoms	1	104	Std. Mean Difference (IV, Random, 95% CI)	-0.55 [-0.95, -0.16]
34.2 Psychosocial functioning	22		Std. Mean Difference (IV, Random, 95% CI)	Subtotals only
34.2.1 GAF	4	204	Std. Mean Difference (IV, Random, 95% CI)	-0.73 [-1.41, -0.05]
34.2.2 GAS	4	330	Std. Mean Difference (IV, Random, 95% CI)	-0.71 [-0.96, -0.46]
34.2.3 SAS	4	283	Std. Mean Difference (IV, Random, 95% CI)	-0.23 [-0.99, 0.53]
34.2.4 SPS	1	24	Std. Mean Difference (IV, Random, 95% CI)	-2.17 [-3.22, -1.13]
34.2.5 QQ45	1	41	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-1.09, 0.15]
34.2.6 WSAS	1	72	Std. Mean Difference (IV, Random, 95% CI)	0.03 [-0.43, 0.49]
34.2.7 CORE-OM	1	41	Std. Mean Difference (IV, Random, 95% CI)	0.29 [-0.34, 0.92]
34.2.8 BDQ	1	48	Std. Mean Difference (IV, Random, 95% CI)	-0.42 [-1.00, 0.16]
34.2.9 SOFAS	1	9	Std. Mean Difference (IV, Random, 95% CI)	-1.22 [-2.73, 0.30]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
34.2.10 SFQ	1	99	Std. Mean Difference (IV, Random, 95% CI)	0.00 [-0.39, 0.39]
34.2.11 SDS	1	61	Std. Mean Difference (IV, Random, 95% CI)	-0.28 [-0.78, 0.23]
34.2.12 CGI	1	59	Std. Mean Difference (IV, Random, 95% CI)	-0.29 [-0.80, 0.22]
34.2.13 HoNOS	1	43	Std. Mean Difference (IV, Random, 95% CI)	-0.07 [-0.69, 0.55]

Analysis 34.1. Comparison 34: Subgroup analysis: types of scales, Outcome 1: BPD symptom severity

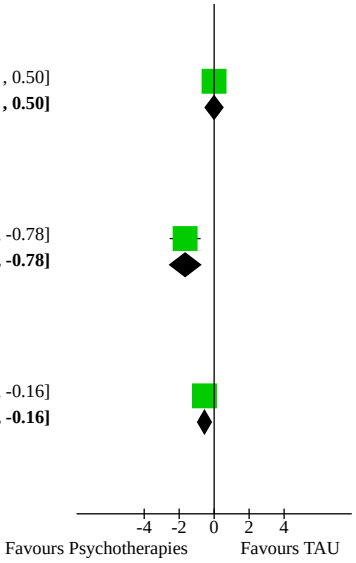
Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
34.1.1 ZAN-BPD								
Blum 2008 (1)	9.8	8.0623	65	13.4	7.6811	59	48.0%	-0.45 [-0.81 , -0.10]
Priebe 2012 (2)	13.1	6.9	33	15.9	7.5	37	27.3%	-0.38 [-0.86 , 0.09]
Reneses 2013 (3)	13	7.9	18	19.1	6.9	26	15.6%	-0.82 [-1.45 , -0.19]
Robinson 2016 (4)	9.64	7.41	12	9.27	7.39	11	9.1%	0.05 [-0.77 , 0.87]
Subtotal (95% CI)			**128**			**133**	**100.0%**	**-0.45 [-0.69 , -0.20]**
Heterogeneity: Tau² = 0.00; Chi² = 2.82, df = 3 (P = 0.42); I² = 0%								
Test for overall effect: Z = 3.53 (P = 0.0004)								
34.1.2 SCID								
Jørgensen 2013 (5)	2.8	2.5	42	3.6	2.1	24	45.6%	-0.33 [-0.84 , 0.17]
Koons 2001a (6)	3.6	1.6	10	4.2	2.3	10	26.7%	-0.29 [-1.17 , 0.59]
Kredlow 2017a (5)	1.17	1.17	14	4.25	3.2	12	27.6%	-1.28 [-2.14 , -0.42]
Subtotal (95% CI)			**66**			**46**	**100.0%**	**-0.58 [-1.16 , -0.00]**
Heterogeneity: Tau² = 0.13; Chi² = 3.79, df = 2 (P = 0.15); I² = 47%								
Test for overall effect: Z = 1.97 (P = 0.05)								
34.1.3 BEST								
Gratz 2006 (7)	25.83	5.72	12	34.7	10.81	10	16.1%	-1.02 [-1.92 , -0.11]
Gratz 2014 (7)	27.47	6.59	31	35.88	5.59	30	37.8%	-1.36 [-1.92 , -0.80]
Gregory 2008b (7)	33.6	12.4	10	38.4	8.62	13	18.5%	-0.44 [-1.28 , 0.39]
Morton 2012 (8)	32.76	12.47	21	47.42	11	20	27.5%	-1.22 [-1.89 , -0.55]
Subtotal (95% CI)			**74**			**73**	**100.0%**	**-1.10 [-1.47 , -0.72]**
Heterogeneity: Tau² = 0.01; Chi² = 3.32, df = 3 (P = 0.34); I² = 10%								
Test for overall effect: Z = 5.74 (P < 0.00001)								
34.1.4 BPDSI								
Laurenssen 2018 (9)	20.63	11.45	54	21.39	10.43	41	35.9%	-0.07 [-0.47 , 0.34]
Leppänen 2016 (10)	17.54	10.14	19	21.48	11.41	32	18.1%	-0.35 [-0.93 , 0.22]
Philips 2018 (11)	17	9.1	13	20.7	9.1	11	9.0%	-0.39 [-1.20 , 0.42]
Schuppert 2012 (12)	13.29	9.53	48	15.39	9	49	37.1%	-0.22 [-0.62 , 0.17]
Subtotal (95% CI)			**134**			**133**	**100.0%**	**-0.21 [-0.45 , 0.04]**
Heterogeneity: Tau² = 0.00; Chi² = 0.91, df = 3 (P = 0.82); I² = 0%								
Test for overall effect: Z = 1.67 (P = 0.10)								
34.1.5 BPP-40								
Bos 2010 (13)	79.7	25.8	26	95.1	29.1	26	100.0%	-0.55 [-1.11 , 0.00]
Subtotal (95% CI)			**26**			**26**	**100.0%**	**-0.55 [-1.11 , 0.00]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.95 (P = 0.05)								
34.1.6 CGI-BPD								
Amianto 2011 (14)	3.3	1	16	3.3	1.1	17	100.0%	0.00 [-0.68 , 0.68]
Subtotal (95% CI)			**16**			**17**	**100.0%**	**0.00 [-0.68 , 0.68]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								
34.1.7 CCGI-BPD								
Soler 2009 (15)	3.5	1.2	29	4.44	0.52	30	100.0%	-1.01 [-1.55 , -0.47]
Subtotal (95% CI)			**29**			**30**	**100.0%**	**-1.01 [-1.55 , -0.47]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.64 (P = 0.0003)								
34.1.8 BPT								
Leichsenring 2016 (16)	18.76	8.6	64	19.41	9.38	58	100.0%	-0.07 [-0.43 , 0.28]
Subtotal (95% CI)			**64**			**58**	**100.0%**	**-0.07 [-0.43 , 0.28]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.40 (P = 0.69)								
34.1.9 BPFS-C								



Analysis 34.1. (Continued)

34.1.9 BPFS-C								
Rossouw 2012b (17)	2.79	0.5385	29	3.06	65.7267	30	100.0%	-0.01 [-0.52 , 0.50]
Subtotal (95% CI)			**29**			**30**	**100.0%**	**-0.01 [-0.52 , 0.50]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.02 (P = 0.98)								
34.1.10 BSI								
Farrell 2009 (18)	18.81	9.47	16	32.75	5.9	12	100.0%	-1.66 [-2.54 , -0.78]
Subtotal (95% CI)			**16**			**12**	**100.0%**	**-1.66 [-2.54 , -0.78]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 3.68 (P = 0.0002)								
34.1.11 Mean number of DSM-IV symptoms								
Doering 2010 (19)	4.79	1.54	52	5.63	1.47	52	100.0%	-0.55 [-0.95 , -0.16]
Subtotal (95% CI)			**52**			**52**	**100.0%**	**-0.55 [-0.95 , -0.16]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 2.77 (P = 0.006)								

Test for subgroup differences: Chi² = 36.04, df = 10 (P < 0.0001), I² = 72.3%

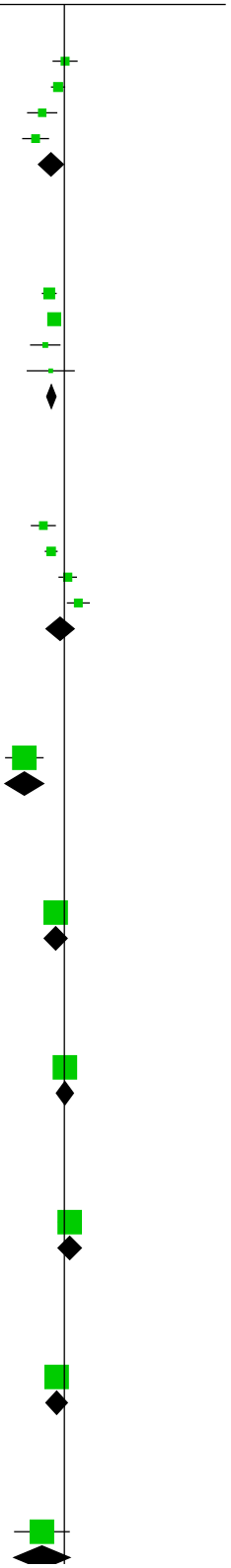


Footnotes

(1) Zan-BPD - total (CR)
(2) ZAN-BPD total (CR)
(3) Clinician rated: ZAN-BPD
(4) Zan-BPD-total (CR)
(5) SCID-BPD (CR)
(6) SCID-II - mean number of BPD criteria met (CR)
(7) BEST (SR)
(8) Self rated: BEST
(9) BPDSI-IV (CR)
(10) Clinician-rated: BPDSI-IV
(11) BPDSI-IV-total (CR)
(12) BPDSI-IV total
(13) Self reported: BPD-40
(14) Clinician rated: CGI-BPD
(15) CCGI-BPD global (CR)
(16) Self rated: Borderline Personality Inventory
(17) BPFS-C (SR)
(18) Self rated: BSI
(19) Clinician-rated: Mean number of DSM-IV BPD criteria met

Analysis 34.2. Comparison 34: Subgroup analysis: types of scales, Outcome 2: Psychosocial functioning

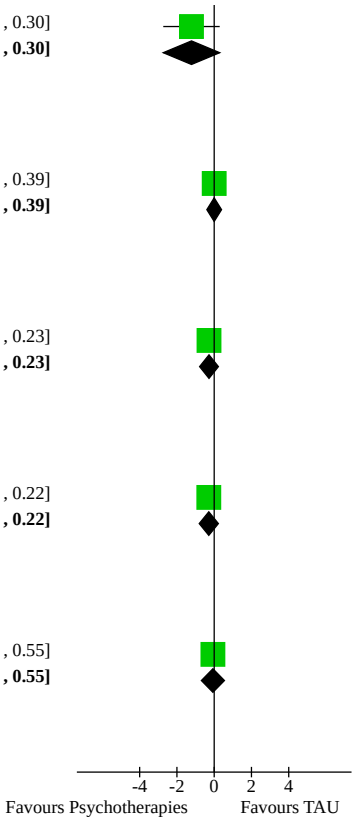
Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
34.2.1 GAF								
Amianto 2011 (1)	-65.9	11.2	16	-66.4	13	17	24.6%	0.04 [-0.64 , 0.72]
Doering 2010 (2)	-58.62	8.04	52	-56.06	6.87	52	29.6%	-0.34 [-0.73 , 0.05]
Farrell 2009 (1)	-60.5	10.17	16	-50.08	5.07	12	22.1%	-1.20 [-2.03 , -0.38]
Salzer 2014 (3)	-65	9.84	17	-51.82	6.82	22	23.7%	-1.56 [-2.29 , -0.83]
Subtotal (95% CI)			**101**			**103**	**100.0%**	**-0.73 [-1.41 , -0.05]**
Heterogeneity: Tau² = 0.37; Chi² = 13.79, df = 3 (P = 0.003); I² = 78%								
Test for overall effect: Z = 2.10 (P = 0.04)								
34.2.2 GAS								
Andreoli 2016 (4)	-62.95	6.2343	140	-57.6	7.6	30	38.5%	-0.82 [-1.22 , -0.42]
Blum 2008 (5)	-50.5	12.8996	65	-43.5	12.2898	59	48.7%	-0.55 [-0.91 , -0.19]
Linehan 1994 (5)	-51.42	9.71	13	-40.43	10.8	13	9.2%	-1.04 [-1.86 , -0.21]
Mehlum 2014 (6)	-59.4	6.6	5	-54.2	6.1	5	3.7%	-0.74 [-2.05 , 0.57]
Subtotal (95% CI)			**223**			**107**	**100.0%**	**-0.71 [-0.96 , -0.46]**
Heterogeneity: Tau² = 0.00; Chi² = 1.63, df = 3 (P = 0.65); I² = 0%								
Test for overall effect: Z = 5.52 (P < 0.00001)								
34.2.3 SAS								
Bateman 1999 (7)	2.7	0.6	20	3.4	0.6	19	23.3%	-1.14 [-1.83 , -0.46]
Bateman 2009 (7)	1.76	0.5	71	2.17	0.64	63	27.1%	-0.72 [-1.07 , -0.36]
Jørgensen 2013 (7)	2.2	0.5	42	2.1	0.6	24	25.5%	0.18 [-0.32 , 0.69]
Reneses 2013 (8)	35.4	8.9	18	27.6	10.8	26	24.1%	0.76 [0.14 , 1.38]
Subtotal (95% CI)			**151**			**132**	**100.0%**	**-0.23 [-0.99 , 0.53]**
Heterogeneity: Tau² = 0.53; Chi² = 25.85, df = 3 (P < 0.0001); I² = 88%								
Test for overall effect: Z = 0.59 (P = 0.55)								
34.2.4 SPS								
Gregory 2008b (9)	-9.7	8.1	11	6.9	6.7	13	100.0%	-2.17 [-3.22 , -1.13]
Subtotal (95% CI)			**11**			**13**	**100.0%**	**-2.17 [-3.22 , -1.13]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 4.07 (P < 0.0001)								
34.2.5 QQ45								
Kramer 2016 (10)	12.76	7.79	21	16	5.42	20	100.0%	-0.47 [-1.09 , 0.15]
Subtotal (95% CI)			**21**			**20**	**100.0%**	**-0.47 [-1.09 , 0.15]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.49 (P = 0.14)								
34.2.6 WSAS								
Borschmann 2013 (11)	26.06	7.98	36	25.81	8.94	36	100.0%	0.03 [-0.43 , 0.49]
Subtotal (95% CI)			**36**			**36**	**100.0%**	**0.03 [-0.43 , 0.49]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.12 (P = 0.90)								
34.2.7 CORE-OM								
Feigenbaum 2012 (12)	2.48	0.85	25	2.22	0.92	16	100.0%	0.29 [-0.34 , 0.92]
Subtotal (95% CI)			**25**			**16**	**100.0%**	**0.29 [-0.34 , 0.92]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.90 (P = 0.37)								
34.2.8 BDQ								
Carter 2010 (13)	8.15	11.48	20	13.07	11.59	28	100.0%	-0.42 [-1.00 , 0.16]
Subtotal (95% CI)			**20**			**28**	**100.0%**	**-0.42 [-1.00 , 0.16]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.42 (P = 0.16)								
34.2.9 SOFAS								
Gleeson 2012 (14)	-67	8.3	4	-50.6	14.1	5	100.0%	-1.22 [-2.73 , 0.30]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-1.22 [-2.73 , 0.30]**



Analysis 34.2. (Continued)

Gleeson 2012 (14)	-67	8.3	4	-50.6	14.1	5	100.0%	-1.22 [-2.73 , 0.30]
Subtotal (95% CI)			**4**			**5**	**100.0%**	**-1.22 [-2.73 , 0.30]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.58 (P = 0.11)								
34.2.10 SFQ								
Davidson 2006 (15)	13.1	4.4	52	13.1	4.6	47	100.0%	0.00 [-0.39 , 0.39]
Subtotal (95% CI)			**52**			**47**	**100.0%**	**0.00 [-0.39 , 0.39]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.00 (P = 1.00)								
34.2.11 SDS								
Gratz 2014 (16)	14.25	6.24	31	16.01	6.24	30	100.0%	-0.28 [-0.78 , 0.23]
Subtotal (95% CI)			**31**			**30**	**100.0%**	**-0.28 [-0.78 , 0.23]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.08 (P = 0.28)								
34.2.12 CGI								
Soler 2009 (17)	3.27	0.9	29	3.57	1.13	30	100.0%	-0.29 [-0.80 , 0.22]
Subtotal (95% CI)			**29**			**30**	**100.0%**	**-0.29 [-0.80 , 0.22]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 1.10 (P = 0.27)								
34.2.13 HoNOS								
Jochems 2015 (18)	12.8	6.36	16	13.22	5.8	27	100.0%	-0.07 [-0.69 , 0.55]
Subtotal (95% CI)			**16**			**27**	**100.0%**	**-0.07 [-0.69 , 0.55]**
Heterogeneity: Not applicable								
Test for overall effect: Z = 0.22 (P = 0.83)								

Test for subgroup differences: Chi² = 32.38, df = 12 (P = 0.001), I² = 62.9%



Footnotes

(1) Clinician rated: GAF
(2) Clinician-rated: GAF
(3) GAF (CR)
(4) Clinician rated: GAS
(5) GAS (CR)
(6) C-GAS (CR)
(7) SAS-SR (SR)
(8) Self reported: SAS-SR (higher scores indicate poorer functioning)
(9) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(10) OQ45, social role at discharge (SR)
(11) WSAS (SR)
(12) CORE-OM (SR)
(13) BDQ-days out of role (SR)
(14) SOFAS (CR)
(15) Self rated: SFQ
(16) Self rated: SDS
(17) CGI-global improvement, patient-rated (SR)
(18) Clinician-rated: HoNOS

Comparison 35. TSA sensitivity analyses: psychotherapy versus TAU

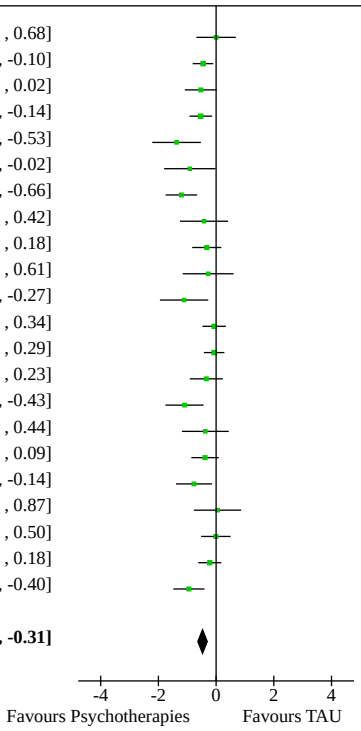
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
35.1 Primary: BPD symptom severity, at end of treatment	22	1244	Std. Mean Difference (IV, Random, 95% CI)	-0.47 [-0.63, -0.31]
35.2 Primary: self-harm	13	616	Mean Difference (IV, Random, 95% CI)	-0.42 [-0.69, -0.15]

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
35.3 Primary: suicide-related outcomes	13	676	Std. Mean Difference (IV, Random, 95% CI)	-0.30 [-0.47, -0.14]
35.4 Primary: psychosocial functioning, at end of treatment	22	1314	Std. Mean Difference (IV, Random, 95% CI)	-0.36 [-0.55, -0.17]
35.5 Secondary: depression	22	1568	Std. Mean Difference (IV, Random, 95% CI)	-0.34 [-0.54, -0.14]

Analysis 35.1. Comparison 35: TSA sensitivity analyses: psychotherapy versus TAU, Outcome 1: Primary: BPD symptom severity, at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Amianto 2011 (1)	10	7.12	16	10	7.12	17	3.7%	0.00 [-0.68 , 0.68]
Blum 2008 (2)	9.8	8.0623	65	13.4	7.6811	59	7.1%	-0.45 [-0.81 , -0.10]
Bos 2010 (3)	12	7.2832	26	15.93	7.2832	26	4.8%	-0.53 [-1.09 , 0.02]
Doering 2010 (4)	11	10.3	52	16.5	10.3	52	6.6%	-0.53 [-0.92 , -0.14]
Farrell 2009 (5)	11	8.4038	16	22.87	8.4038	12	2.8%	-1.37 [-2.21 , -0.53]
Gratz 2006 (6)	10	7.7071	12	17.29	7.7071	10	2.6%	-0.91 [-1.80 , -0.02]
Gratz 2014 (6)	10	7.9654	31	19.72	7.9654	30	4.8%	-1.20 [-1.75 , -0.66]
Gregory 2008b (6)	10	7.2512	10	13.15	7.2512	13	2.8%	-0.42 [-1.25 , 0.42]
Jørgensen 2013 (7)	10	7.1908	42	12.36	7.1908	24	5.3%	-0.32 [-0.83 , 0.18]
Koons 2001a (8)	10	7.1778	10	12.07	7.1778	10	2.6%	-0.28 [-1.16 , 0.61]
Kredlow 2017a (7)	10	7.9817	14	19.15	7.9817	12	2.8%	-1.11 [-1.95 , -0.27]
Laurenssen 2018 (9)	10	7.1448	54	10.5	7.1448	41	6.4%	-0.07 [-0.48 , 0.34]
Leichsenring 2016 (10)	10	7.1708	64	10.5	7.1708	58	7.1%	-0.07 [-0.42 , 0.29]
Leppänen 2016 (11)	10	7.2508	19	12.5	7.2508	32	4.6%	-0.34 [-0.91 , 0.23]
Morton 2012 (12)	10	7.8095	21	18.72	7.8095	20	3.9%	-1.09 [-1.76 , -0.43]
Philips 2018 (13)	10	7.2009	13	12.79	7.2009	11	2.9%	-0.37 [-1.19 , 0.44]
Priebe 2012 (14)	13.1	6.9	33	15.9	7.5	37	5.6%	-0.38 [-0.86 , 0.09]
Reneses 2013 (15)	10	7.5011	18	15.86	7.5011	26	4.2%	-0.77 [-1.39 , -0.14]
Robinson 2016 (16)	9.64	7.41	12	9.27	7.39	11	2.9%	0.05 [-0.77 , 0.87]
Rossouw 2012b (17)	10	7.1424	29	10.07	7.1424	30	5.2%	-0.01 [-0.52 , 0.50]
Schuppert 2012 (18)	10	7.0908	48	11.57	7.0908	49	6.5%	-0.22 [-0.62 , 0.18]
Soler 2009 (19)	10	7.5648	29	17.22	7.5648	30	4.9%	-0.94 [-1.48 , -0.40]
Total (95% CI)			**634**			**610**	**100.0%**	**-0.47 [-0.63 , -0.31]**

Heterogeneity: Tau² = 0.06; Chi² = 38.89, df = 21 (P = 0.01); I² = 46%
Test for overall effect: Z = 5.66 (P < 0.00001)
Test for subgroup differences: Not applicable



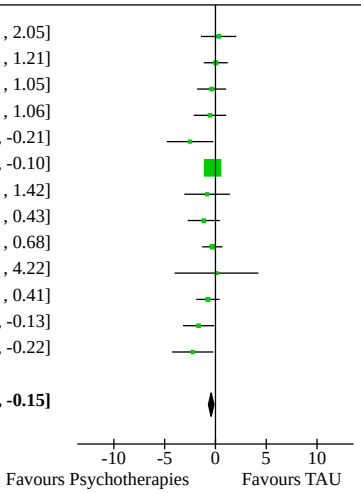
Footnotes

(1) Clinician rated: CGI-BPD
(2) Zan-BPD - total (CR)
(3) Self reported: BPD-40
(4) Clinician-rated: Mean number of DSM-IV BPD criteria met
(5) Self rated: BSI
(6) BEST (SR)
(7) SCID-BPD (CR)
(8) SCID-II - mean number of BPD criteria met (CR)
(9) BPDSI-IV (CR)
(10) Self rated: Borderline Personality Inventory
(11) Clinician-rated: BPDSI-IV
(12) Self rated: BEST
(13) BPDSI-IV-total (CR)
(14) ZAN-BPD total (CR)
(15) Clinician rated: ZAN-BPD
(16) Zan-BPD-total (CR)
(17) BPFS-C (SR)
(18) BPDSI-IV total
(19) CCGI-BPD global (CR)

Analysis 35.2. Comparison 35: TSA sensitivity analyses: psychotherapy versus TAU, Outcome 2: Primary: self-harm

	Psychotherapies			TAU				Mean Difference	Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Amianto 2011 (1)	1.9	2.5488	16	1.59	2.5488	17	2.3%	0.31 [-1.43 , 2.05]	
Borschmann 2013 (2)	2.3	2.5543	36	2.27	2.5543	36	4.9%	0.03 [-1.15 , 1.21]	
Carter 2010 (3)	3.2	2.5439	20	3.58	2.5439	31	3.4%	-0.38 [-1.81 , 1.05]	
Feigenbaum 2012 (4)	2.1	2.5498	25	2.64	2.5498	16	2.7%	-0.54 [-2.14 , 1.06]	
Gratz 2006 (5)	2.6	2.7288	12	5.1	2.7288	10	1.4%	-2.50 [-4.79 , -0.21]	
Gratz 2014 (5)	0.69	0.35	31	0.97	0.35	30	63.9%	-0.28 [-0.46 , -0.10]	
Koons 2001a (6)	1.9	2.5556	10	2.72	2.5556	10	1.4%	-0.82 [-3.06 , 1.42]	
Linehan 1991 (7)	1.2	2.5801	20	2.35	2.5801	21	2.8%	-1.15 [-2.73 , 0.43]	
Linehan 2006 (4)	2.1	2.537	52	2.41	2.537	49	6.8%	-0.31 [-1.30 , 0.68]	
Philips 2018 (8)	2.3	5.5	13	2.2	4.8	11	0.4%	0.10 [-4.02 , 4.22]	
Priebe 2012 (9)	2.3	2.5576	38	3.04	2.5576	38	5.2%	-0.74 [-1.89 , 0.41]	
Van den Bosch 2005 (10)	2.1	2.6447	22	3.76	2.6447	24	3.0%	-1.66 [-3.19 , -0.13]	
Weinberg 2006 (11)	2.4	2.7198	15	4.64	2.7198	13	1.7%	-2.24 [-4.26 , -0.22]	
Total (95% CI)			**310**			**306**	**100.0%**	**-0.42 [-0.69 , -0.15]**	

Heterogeneity: Tau² = 0.02; Chi² = 12.79, df = 12 (P = 0.38); I² = 6%
Test for overall effect: Z = 3.08 (P = 0.002)
Test for subgroup differences: Not applicable



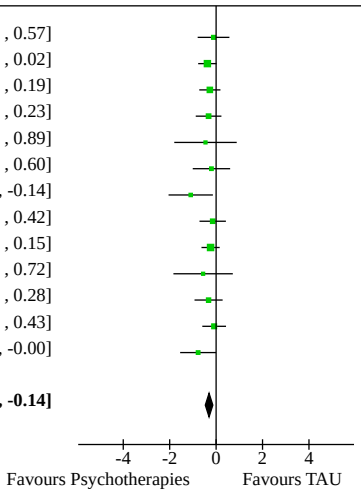
Footnotes

(1) self-harming incidents
(2) SHQ - number of suicidal and self-injurious episodes (past 6 months) (SR)
(3) number of self-harm episodes 3 to 6 months
(4) SASII - frequency of self-harm (CR)
(5) DSHI (SR)
(6) PHI - deliberate self-harm frequency (last 3 months) (CR)
(7) Mean number of parasuicidal acts (last 3 months)
(8) DSHI-SF (SR)
(9) Days of self-harm and type of deliberate self-harm recorded in an interview (CR)
(10) LPC - self-mutilation (last 3 months) (CR)
(11) PHI - deliberate self-harm frequency (CR)

Analysis 35.3. Comparison 35: TSA sensitivity analyses: psychotherapy versus TAU, Outcome 3: Primary: suicide-related outcomes

	Psychotherapies			TAU				Std. Mean Difference	Std. Mean Difference
Study or Subgroup	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Total**	**Weight**	**IV, Random, 95% CI**	**IV, Random, 95% CI**
Amianto 2011 (1)	0.4	0.3516	16	0.44	0.3516	17	5.6%	-0.11 [-0.79 , 0.57]	
Andreoli 2016 (2)	0.2	0.5833	140	0.42	0.5833	30	16.6%	-0.38 [-0.77 , 0.02]	
Davidson 2006 (3)	0.3	0.3307	43	0.39	0.3307	33	12.6%	-0.27 [-0.73 , 0.19]	
Feigenbaum 2012 (4)	0.43	0.2732	25	0.52	0.2732	26	8.6%	-0.32 [-0.88 , 0.23]	
Gleeson 2012 (5)	0.5	0.3499	4	0.68	0.3499	5	1.4%	-0.46 [-1.80 , 0.89]	
Gregory 2008b (6)	0.36	0.3363	11	0.43	0.3363	13	4.0%	-0.20 [-1.01 , 0.60]	
Koons 2001a (7)	0.6	0.3765	10	1.03	0.3765	10	2.9%	-1.09 [-2.05 , -0.14]	
Leppänen 2016 (8)	0.4	0.3347	19	0.45	0.3347	32	8.1%	-0.15 [-0.72 , 0.42]	
Linehan 2006 (4)	0.5	0.3331	52	0.58	0.3331	49	17.0%	-0.24 [-0.63 , 0.15]	
Mehlum 2014 (9)	0.25	0.355	5	0.47	0.355	5	1.6%	-0.56 [-1.84 , 0.72]	
Reneses 2013 (10)	0.3	0.3328	18	0.41	0.3328	26	7.1%	-0.32 [-0.93 , 0.28]	
Soler 2009 (11)	0.4	0.3527	29	0.43	0.3527	30	10.0%	-0.08 [-0.59 , 0.43]	
Weinberg 2006 (12)	0.43	0.3635	15	0.72	0.3635	13	4.4%	-0.77 [-1.55 , -0.00]	
Total (95% CI)			**387**			**289**	**100.0%**	**-0.30 [-0.47 , -0.14]**	

Heterogeneity: Tau² = 0.00; Chi² = 5.89, df = 12 (P = 0.92); I² = 0%
Test for overall effect: Z = 3.68 (P = 0.0002)
Test for subgroup differences: Not applicable



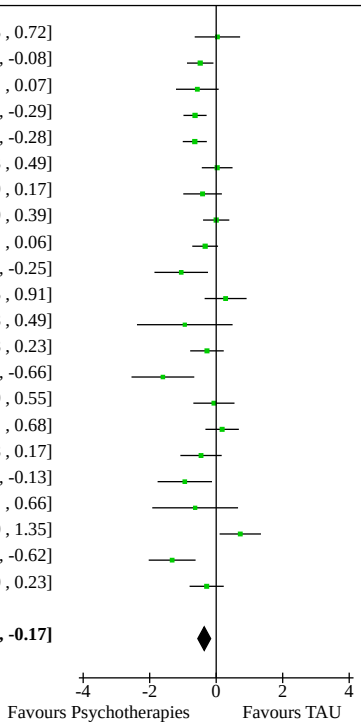
Footnotes

(1) CGI-BPD, suicidality and self-damaging acts (CR)
(2) Episode of suicidal ideation, with or without deliberate self-harm
(3) DSHI - cumulative number of suicide attempts
(4) SASII-suicide attempts (CR)
(5) OAS-M - suicidality (CR)
(6) LPC - parasuicides per last 3 months
(7) BSS (SR)
(8) BPDSI-IV - Parasuicidality, suicide plans and attempts (CR)
(9) SIQ-jr (SR)
(10) Clinician rated: LSASI
(11) CGI-BPD, suicidality (CR)
(12) SBQ (SR)

Analysis 35.4. Comparison 35: TSA sensitivity analyses: psychotherapy versus TAU, Outcome 4: Primary: psychosocial functioning, at end of treatment

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Amianto 2011 (1)	60	9.5359	16	59.64	9.5359	17	4.0%	0.04 [-0.65 , 0.72]
Andreoli 2016 (2)	61	9.1804	140	65.43	9.1804	30	6.1%	-0.48 [-0.88 , -0.08]
Bateman 1999 (3)	58	9.3646	20	63.42	9.3646	19	4.3%	-0.57 [-1.21 , 0.07]
Bateman 2009 (3)	59	9.0498	71	64.79	9.0498	63	6.5%	-0.64 [-0.98 , -0.29]
Blum 2008 (4)	62	9.2216	65	67.97	9.2216	59	6.4%	-0.64 [-1.01 , -0.28]
Borschmann 2013 (5)	57	9.005	36	56.73	9.005	36	5.6%	0.03 [-0.43 , 0.49]
Carter 2010 (6)	61	9.1318	20	64.8	9.1318	28	4.7%	-0.41 [-0.99 , 0.17]
Davidson 2006 (7)	60	8.9487	52	60	8.9487	47	6.1%	0.00 [-0.39 , 0.39]
Doering 2010 (8)	59	9.1836	52	62.07	9.1836	52	6.2%	-0.33 [-0.72 , 0.06]
Farrell 2009 (1)	62	10.0204	16	72.85	10.0204	12	3.4%	-1.05 [-1.86 , -0.25]
Feigenbaum 2012 (9)	62	9.0678	25	59.38	9.0678	16	4.4%	0.28 [-0.35 , 0.91]
Gleeson 2012 (10)	60	10.3819	4	71.03	10.3819	5	1.5%	-0.94 [-2.38 , 0.49]
Gratz 2014 (11)	61	9.0047	31	63.53	9.0047	30	5.3%	-0.28 [-0.78 , 0.23]
Gregory 2008b (12)	58	11.819	11	77.62	11.819	13	2.8%	-1.60 [-2.55 , -0.66]
Jochems 2015 (13)	61	9.0724	16	61.63	9.0724	27	4.5%	-0.07 [-0.69 , 0.55]
Jørgensen 2013 (3)	59	9.0126	42	57.37	9.0126	24	5.3%	0.18 [-0.32 , 0.68]
Kramer 2016 (14)	62	9.1448	21	66.25	9.1448	20	4.4%	-0.46 [-1.08 , 0.17]
Linehan 1994 (4)	63	9.6389	13	72.4	9.6389	13	3.3%	-0.94 [-1.76 , -0.13]
Mehlum 2014 (15)	60	9.5515	5	66.69	9.5515	5	1.8%	-0.63 [-1.92 , 0.66]
Reneses 2013 (16)	60	9.3183	18	53.13	9.3183	26	4.4%	0.72 [0.10 , 1.35]
Salzer 2014 (17)	57	10.428	17	71.1	10.428	22	3.9%	-1.32 [-2.03 , -0.62]
Soler 2009 (18)	60	9.0321	29	62.62	9.0321	30	5.2%	-0.29 [-0.80 , 0.23]
Total (95% CI)			**720**			**594**	**100.0%**	**-0.36 [-0.55 , -0.17]**

Heterogeneity: Tau² = 0.12; Chi² = 53.41, df = 21 (P = 0.0001); I² = 61%
Test for overall effect: Z = 3.66 (P = 0.0003)
Test for subgroup differences: Not applicable



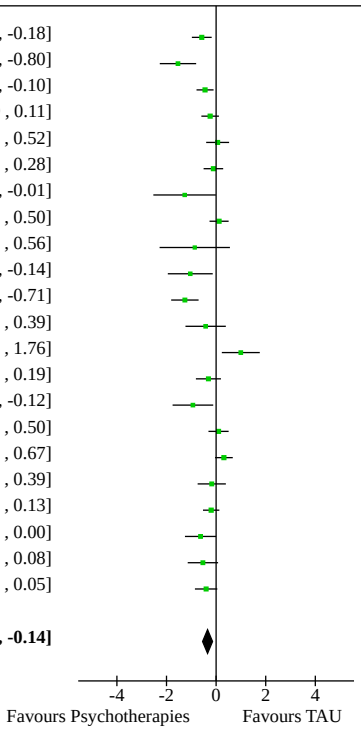
Footnotes

(1) Clinician rated: GAF
(2) Clinician rated: GAS
(3) SAS-SR (SR)
(4) GAS (CR)
(5) WSAS (SR)
(6) BDQ-days out of role (SR)
(7) Self rated: SFQ
(8) Clinician-rated: GAF
(9) CORE-OM (SR)
(10) SOFAS (CR)
(11) Self rated: SDS
(12) SPS - "How many days were you paid for working in the past 30 days?") (SR)
(13) Clinician-rated: HoNOS
(14) OQ45, social role at discharge (SR)
(15) C-GAS (CR)
(16) Self reported: SAS-SR (higher scores indicate poorer functioning)
(17) GAF (CR)
(18) CGI-global improvement, patient-rated (SR)

Analysis 35.5. Comparison 35: TSA sensitivity analyses: psychotherapy versus TAU, Outcome 5: Secondary: depression

Study or Subgroup	Psychotherapies Mean	SD	Total	TAU Mean	SD	Total	Weight	Std. Mean Difference IV, Random, 95% CI
Andreoli 2016 (1)	9	6.3908	140	12.71	6.3908	30	5.6%	-0.58 [-0.98 , -0.18]
Bateman 1999 (2)	10	7.9258	19	22.45	7.9258	19	3.7%	-1.54 [-2.27 , -0.80]
Bateman 2009 (2)	9.6	6.3083	71	12.43	6.3083	63	6.0%	-0.45 [-0.79 , -0.10]
Blum 2008 (3)	9.7	6.2423	65	11.21	6.2423	59	5.9%	-0.24 [-0.59 , 0.11]
Borschmann 2013 (4)	10.47	3.54	36	10.2	4.96	36	5.2%	0.06 [-0.40 , 0.52]
Davidson 2006 (5)	8.9	6.2362	52	9.59	6.2362	47	5.7%	-0.11 [-0.50 , 0.28]
Davidson 2014 (6)	21.73	9.86	11	33.5	2.38	4	1.9%	-1.27 [-2.53 , -0.01]
Doering 2010 (7)	9.9	6.2178	52	9.15	6.2178	52	5.7%	0.12 [-0.27 , 0.50]
Gleeson 2012 (8)	8.7	7.081	4	15.56	7.081	5	1.6%	-0.86 [-2.28 , 0.56]
Gratz 2006 (9)	9.6	6.9709	12	17.15	6.9709	10	2.9%	-1.04 [-1.95 , -0.14]
Gratz 2014 (9)	9.8	7.1519	31	18.92	7.1519	30	4.7%	-1.26 [-1.81 , -0.71]
Gregory 2008b (10)	10.1	6.3392	11	12.87	6.3392	13	3.3%	-0.42 [-1.24 , 0.39]
Jahangard 2012 (11)	10.3	6.7628	15	3.38	6.7628	15	3.5%	1.00 [0.23 , 1.76]
Jørgensen 2013 (5)	10	6.4005	42	12.01	6.4005	24	5.0%	-0.31 [-0.81 , 0.19]
Kredlow 2017a (5)	10.1	6.77	14	16.64	6.77	12	3.3%	-0.94 [-1.75 , -0.12]
Laurenssen 2018 (7)	9.3	6.3548	54	8.67	6.3548	41	5.6%	0.10 [-0.31 , 0.50]
Leichsenring 2016 (12)	10.1	6.3604	64	8.09	6.3604	58	5.9%	0.31 [-0.04 , 0.67]
Leppänen 2016 (13)	8.7	6.3243	19	9.83	6.3243	32	4.6%	-0.18 [-0.74 , 0.39]
McMurran 2016 (14)	11.1	6.2976	80	12.36	6.2976	64	6.1%	-0.20 [-0.53 , 0.13]
Morton 2012 (15)	9.9	6.581	21	14.11	6.581	20	4.2%	-0.63 [-1.26 , 0.00]
Reneses 2013 (16)	9.8	6.4895	18	13.32	6.4895	26	4.3%	-0.53 [-1.14 , 0.08]
Zanarini 2018 (17)	10.1	6.4913	39	12.74	6.4913	38	5.3%	-0.40 [-0.85 , 0.05]
Total (95% CI)			**870**			**698**	**100.0%**	**-0.34 [-0.54 , -0.14]**

Heterogeneity: Tau² = 0.14; Chi² = 68.69, df = 21 (P < 0.00001); I² = 69%
Test for overall effect: Z = 3.38 (P = 0.0007)
Test for subgroup differences: Not applicable



Footnotes
(1) Clinician rated: HDRS-17
(2) Self rated: BDI
(3) Self reported: BDI
(4) Self rated: HADS, depression
(5) BDI-II (SR)
(6) HADS - total score (SR)
(7) Self-rated: BDI
(8) MADRS (CR)
(9) DASS-Depression (SR)
(10) BDI (SR)
(11) HDRS (CR)
(12) Clinician rated: BDI
(13) Clinician-rated: BPDSI-IV, paranoid ideation
(14) HADS (SR)
(15) Self rated: DASS, depression
(16) Clinician rated: MADRS
(17) Self rated: The Clinically Useful Depression Outcome Scale, total score

ADDITIONAL TABLES

Table 1. Unused methods

Section	Protocol (Storebø 2018)	Review
Unit of analysis issues	**Cross-over trials** We would have included cross-over trials. We planned to include data up to the point of first cross-over (first period only; Curtin 2002). We did not intend	We did not include any cross-over trial.

Table 1. Unused methods *(Continued)*

	to use data from subsequent periods due to the likelihood of carry-over effects from the preceding treatment(s). We planned not to combine repeated participant interventions in one meta-analysis.	
	Cluster-randomised trials Had trials used cluster randomisation, we would have anticipated that investigators would have presented their results after appropriately controlling for clustering effects (robust standard errors or hierarchical linear models). If it had been unclear whether a cluster-randomised trial had used appropriate controls for clustering, we would have contacted the investigators for further information. We would have requested and re-analysed individual patient data using multilevel models that controlled for clustering, if appropriate controls had not been used. Following this, we would have analysed effect sizes and standard errors in RevMan 5 (Review Manager 2014), using the generic inverse method (Higgins 2011). If there had been insufficient information to control for clustering, we would have entered outcome data using individuals as the units of analysis, and then conducted a sensitivity analysis to assess the potential biasing effects of inadequately controlled cluster-randomised trials (Donner 2002). If individual participant data had not been available, we would have looked for information on intra-class correlation coefficients to adjust for the potential clustering effects.	We did not include any cluster-randomised trial.
	Adjustment for multiplicity We planned to adjust the P values and CIs for multiplicity due to the many secondary outcome comparisons following the method described by Jakobsen 2014.	We only adjusted the primary outcomes and one secondary outcomes for multiplicity, i.e. those outcomes presented in the SoF table.
Dealing with missing data	Had dichotomous data not been presented on the basis of ITT data, we would have added the number of participants lost in each group to the participants with unfavourable results, acting on the assumption that most people with BPD do not get lost at random.	We were unable to perform this analysis due to insufficient information
Subgroup analysis and investigation of heterogeneity	We intended to conduct subgroup analyses to make hypotheses about the subgroups mentioned below. 1. Sex (male versus female) 2. Comorbidity (people with comorbidity versus people without comorbidity) 3. Treatment intensity (once a week compared to more than once a week 4. Concurrent-drug interventions (trials with concurrent-drug interventions compared to those without)	We did not conduct these preplanned analyses because of lack of data.
Sensitivity analysis	We intended to assess the impact of heterogeneity on the overall pooled effect estimate by removing studies ('outliers') that contributed to heterogeneity. We intended to remove outliers one by one and assess the impact on the overall outcome. 1. Decisions made during the review process (our assessment of the level of clinical heterogeneity) 2. Impact of bias (studies with low and high risk of bias) 3. Type of data collection (for example, different ways to measure depression) 4. Imputed data (comparing analyses with available outcome data with those using an ITT approach)	We were not able to perform these analyses, due to a lack of sufficient data.
TSA	We intended to calculate post hoc, low bias, risk diversity-adjusted required information size TSA analyses for the primary outcomes.	We were not able to perform these analyses

Table 1. Unused methods *(Continued)*

	with low risk of bias trials.

BPD: borderline personality disorder; **CI:** confidence interval;**ITT:** intention to treat; **TAU:** treatment-as-usual

Table 2. Key demographic characteristics of the included studies

Category	Study frequency	Study ID
Sample size		
Sample size above 100 participants	5	Andreoli 2016; Antonsen 2017; Linehan 2006; McMain 2009; McMurran 2016
Setting		
Studies with inpatient settings	5	Jahangard 2012; Leichsenring 2016; Mohamadizadeh 2017; Schilling 2018; Stanley 2017
Studies with both inpatient and outpatient settings	7	Antonsen 2017; Bateman 1999; Davidson 2014; Gleeson 2012; Kredlow 2017b; Laurenssen 2018; Smith 2012
Gender		
Only females included	17	Carter 2010; Doering 2010; Farrell 2009; Gratz 2006; Gratz 2014; Harned 2014; Koons 2001a; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; Mohamadizadeh 2017; Smith 2012; Van den Bosch 2005; Weinberg 2006; Zanarini 2008; Zanarini 2018
Only males included	2	Bianchini 2019; Kamalabadi 2012
Diagnostic classification		
DSM-III diagnosis	1	Linehan 1991
DSM-III-R diagnosis	4	Bateman 1999; Koons 2001a; Linehan 1994; Turner 2000
DSM-IV diagnosis	6	Borschmann 2013; McMurran 2016; Mohamadizadeh 2017; Priebe 2012; Rossouw 2012b; Schilling 2018
DSM-IV-TR diagnosis	54	Andreoli 2016; Antonsen 2017; Bateman 2009; Bellino 2006; Bellino 2007; Bellino 2010; Blum 2008; Bos 2010; Carter 2010; Cottraux 2009; Davidson 2006; Davidson 2014; Doering 2010; Elices 2016; Feigenbaum 2012; Feliu-Soler 2017; Giesen-Bloo 2006; Gleeson 2012; Gratz 2006; Gratz 2014; Gregory 2008b; Haeyen 2018; Harned 2014; Jahangard 2012; Jochems 2015; Jørgensen 2013; Kamalabadi 2012; Kramer 2011; Kramer 2014; Kramer 2016: Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leppänen 2016; Lin 2019; Linehan 2006; McMain 2009; McMain 2017; Morey 2010; Morton 2012; Nadort 2009; Pascual 2015; Philips 2018; Reneses 2013; Robinson 2016; Santisteban 2015; Schilling 2018; Sinnaeve 2018; Soler 2009; Smith 2012; Van den Bosch 2005; Weinberg 2006; Zanarini 2008; Zanarini 2018
ICD-10 diagnosis	1	Leichsenring 2016
Diagnostic assessment		

Table 2. Key demographic characteristics of the included studies *(Continued)*

BPDSI-IV (Arntz 2003)	1	Kamalabadi 2012
CI-BPD (Zanarini 2003b)	1	Rossouw 2012b
DIB (Gunderson 1981) or DIB-R (Zanarini 1989)	4	Cottraux 2009; Feliu-Soler 2017; Linehan 1991; Zanarini 2008
DIB-R (Zanarini 1989) and the BSI (Conte 1980)	1	Farrell 2009
DIB-R (Zanarini 1989) plus any other DSM-oriented diagnostic interview SCID-II (First 1997)	1	Bateman 1999
DIPD-IV (Zanarini 1987)	3	Gratz 2006; Gratz 2014; Morey 2010
IPDE (Loranger 1995)	4	Andreoli 2016; Harned 2014; McMain 2017; McMurran 2016
IPDE-self-rating screening and questionnaire, with the preliminary findings confirmed in clinical interviews by a psychiatrist	1	Carter 2010
Millon Clinical Multiaxial Inventory, 3rd Edition (MCMI-III)	1	Jahangard 2012
PDE (Loranger 1988)	1	Turner 2000
SCID-II (First 1997)	46	Amianto 2011; Antonsen 2017; Bateman 1999; Bateman 2009; Bellino 2006; Bellino 2007; Bellino 2010; Borschmann 2013; Bos 2010; Davidson 2006; Davidson 2014; Doering 2010; Elices 2016; Feigenbaum 2012; Giesen-Bloo 2006; Gleeson 2012; Gregory 2008b; Haeyen 2018; Jørgensen 2013; Koons 2001a; Kramer 2011; Kramer 2014; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Lin 2019; Linehan 1994; Linehan 2006; Linehan 2015a; Koons 2001a; Morton 2012; Nadort 2009; Pascual 2015; Philips 2018; Priebe 2012; Reneses 2013; Robinson 2016; Schilling 2018; Soler 2009; Smith 2012; Van den Bosch 2005; Weinberg 2006; Zanarini 2018
SIDP-IV (Pfohl 1997)	1	Blum 2008
Exclusion criteria in included studies		
Participants with substance abuse or dependence excluded	43	Amianto 2011; Andreoli 2016; Antonsen 2017; Bateman 1999; Bateman 2009; Bellino 2006; Bellino 2007; Bellino 2010; Blum 2008; Carmona í Farrés 2019; Cottraux 2009; Davidson 2006; Doering 2010; Feigenbaum 2012; Giesen-Bloo 2006; Gratz 2006; Gratz 2014; Jørgensen 2013; Kamalabadi 2012; Koons 2001a; Kramer 2011; Kredlow 2017a; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Lin 2019; Linehan 1991; Linehan 1994; McMain 2009; Mohamadizadeh 2017; Morey 2010; Nadort 2009; Pascual 2015; Rossouw 2012b; Schilling 2018; Schuppert 2012; Sinnaeve 2018; Soler 2009; Stanley 2017; Smith 2012; Weinberg 2006; Zanarini 2008; Zanarini 2018

Table 2. Key demographic characteristics of the included studies *(Continued)*

Alcohol or substance abuse and dependence included	4	Davidson 2014; Gregory 2008b; Robinson 2016; Santisteban 2015
Antisocial features or full antisocial personality disorders excluded	9	Antonsen 2017; Carter 2010; Cottraux 2009; Doering 2010; Giesen-Bloo 2006; Jørgensen 2013; Kamalabadi 2012; Koons 2001a; Nadort 2009
Duration of interventions		
Less than six months	36	Andreoli 2016; Antonsen 2017; Blum 2008; Bohus 2013; Borschmann 2013; Bos 2010; Davidson 2014; Elices 2016; Feliu-Soler 2017; Gleeson 2012; Gratz 2006; Gratz 2014; Haeyen 2018; Jahangard 2012; Kamalabadi 2012; Kramer 2011; Kramer 2014; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Leichsenring 2016; Lin 2019; McMain 2017; McMurran 2016; Mehlum 2014; Mohamadizadeh 2017; Morey 2010; Morton 2012; Pascual 2015; Reneses 2013; Schilling 2018; Schuppert 2012; Soler 2009; Weinberg 2006; Zanarini 2008; Zanarini 2018
Between six months and 12 months	32	Amianto 2011; Bellino 2006; Bellino 2007; Bellino 2010; Bianchini 2019; Carmona í Farrés 2019; Carter 2010; Cottraux 2009; Davidson 2006; Doering 2010; Farrell 2009; Feigenbaum 2012; Gregory 2008b; Harned 2014; Jochems 2015; Koons 2001a; Leppänen 2016; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; McMain 2009; Priebe 2012; Robinson 2016; Rossouw 2012b; Salzer 2014; Santisteban 2015; Sinnaeve 2018; Stanley 2017; Smith 2012; Turner 2000; Van den Bosch 2005
Longer than 12 months	7	Bateman 1999; Bateman 2009; Giesen-Bloo 2006; Jørgensen 2013; Laurenssen 2018; Nadort 2009; Philips 2018
Formats of interventions		
Individual treatment	33	Amianto 2011; Andreoli 2016; Borschmann 2013; Bellino 2006; Bellino 2007; Bellino 2010; Cottraux 2009; Davidson 2006; Davidson 2014; Doering 2010; Giesen-Bloo 2006; Gleeson 2012; Harned 2014; Jahangard 2012; Kramer 2011; Kramer 2014; Kredlow 2017a; Kredlow 2017b; Leichsenring 2016; McMain 2009; McMurran 2016; Mohamadizadeh 2017; Morey 2010; Nadort 2009; Philips 2018; Priebe 2012; Reneses 2013; Salzer 2014; Stanley 2017; Smith 2012; Weinberg 2006; Zanarini 2008; Zanarini 2018
Group treatment	22	Antonsen 2017; Blum 2008; Bohus 2013; Bos 2010; Elices 2016; Farrell 2009; Feliu-Soler 2017; Gratz 2006; Gratz 2014; Haeyen 2018; Jochems 2015; Kamalabadi 2012; Kramer 2016; Leppänen 2016; Lin 2019; Linehan 2015a; McMain 2017; Morton 2012; Pascual 2015; Santisteban 2015; Schilling 2018; Soler 2009
Combination of individual and group treatment	16	Bateman 1999; Bateman 2009; Bianchini 2019; Carter 2010; Feigenbaum 2012; Gregory 2008b; Jørgensen 2013; Koons 2001a; Linehan 1991; Linehan 1994; Linehan 2006; Laurenssen 2018; Robinson 2016; Rossouw 2012b; Turner 2000; Van den Bosch 2005
Concomitant medication		
Allowed, if needed	59	Amianto 2011; Andreoli 2016; Antonsen 2017; Bateman 1999; Bateman 2009; Blum 2008; Bohus 2013; Borschmann 2013; Bos 2010; Carmona í Farrés 2019; Cottraux 2009; Davidson 2006; Doering 2010; Elices 2016; Farrell 2009; Feigenbaum 2012; Feliu-Soler 2017; Giesen-Bloo 2006; Gleeson 2012; Gratz 2006; Gratz 2014; Gregory 2008b; Harned 2014; Jochems 2015; Jørgensen 2013; Koons 2001a; Kramer 2011; Kramer 2014; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; McMain 2009; McMain 2017; McMurran 2016;

Table 2. Key demographic characteristics of the included studies *(Continued)*

		Mehlum 2014; Morey 2010; Morton 2012; Nadort 2009; Pascual 2015; Priebe 2012; Reneses 2013; Rossouw 2012b; Salzer 2014; Schilling 2018; Schuppert 2012; Sinnaeve 2018; Smith 2012; Soler 2009; Turner 2000; Van den Bosch 2005; Weinberg 2006; Zanarini 2008; Zanarini 2018
All participants of each group received the same kind of concomitant medication	4	Bellino 2006; Bellino 2007; Bellino 2010; Jahangard 2012
Partly (50% of each group concomitantly received a specified, concurrent medication, 50% placebo)	1	Stanley 2017
Not allowed	2	Lin 2019; Mohamadizadeh 2017
Not specified	9	Bianchini 2019; Carter 2010; Davidson 2014; Haeyen 2018; Kamalabadi 2012; Leppänen 2016; Philips 2018; Robinson 2016; Santisteban 2015
Control interventions		
Obligatory	42	Amianto 2011; Andreoli 2016; Bateman 1999; Bateman 2009; Bellino 2006; Bellino 2010; Bianchini 2019; Borschmann 2013; Bos 2010; Carter 2010; Davidson 2014; Doering 2010; Farrell 2009; Feigenbaum 2012; Gleeson 2012; Gratz 2006; Gratz 2014; Jahangard 2012; Jochems 2015;Jørgensen 2013; Koons 2001a; Kramer 2016; Laurenssen 2018; Leichsenring 2016; Leppänen 2016; Linehan 2006; McMurran 2016; Mehlum 2014; Morton 2012; Mohamadizadeh 2017; Philips 2018; Priebe 2012; Reneses 2013; Robinson 2016; Rossouw 2012b; Schuppert 2012; Soler 2009; Stanley 2017; Smith 2012; Van den Bosch 2005; Weinberg 2006; Zanarini 2018
Optional	13	Blum 2008; Bohus 2013; Davidson 2006; Gregory 2008b; Haeyen 2018; Kamalabadi 2012; Kredlow 2017a; Linehan 1991; Linehan 1994; McMain 2017; Mohamadizadeh 2017; Salzer 2014; Zanarini 2008
Funding		
Funded by grants from universities, authorities or research foundations	62	Amianto 2011; Antonsen 2017; Bateman 1999; Bateman 2009; Blum 2008; Bohus 2013; Borschmann 2013; Bos 2010; Carmona í Farrés 2019; Cottraux 2009; Davidson 2006; Davidson 2014; Doering 2010; Elices 2016; Farrell 2009; Feigenbaum 2012; Feliu-Soler 2017; Giesen-Bloo 2006; Gleeson 2012; Gratz 2006; Gratz 2014; Gregory 2008b; Haeyen 2018; Harned 2014; Jochems 2015; Jørgensen 2013; Kramer 2011; Kramer 2014; Kramer 2016; Kredlow 2017a; Kredlow 2017b; Laurenssen 2018; Leichsenring 2016; Lin 2019; Linehan 1991; Linehan 1994; Linehan 2006; Linehan 2015a; McMain 2009; McMain 2017; McMurran 2016; Mehlum 2014; Morey 2010; Nadort 2009; Pascual 2015; Philips 2018; Priebe 2012; Reneses 2013; Robinson 2016; Rossouw 2012b; Salzer 2014; Santisteban 2015; Schilling 2018; Schuppert 2012; Sinnaeve 2018; Smith 2012; Soler 2009; Stanley 2017; Van den Bosch 2005; Weinberg 2006; Zanarini 2008; Zanarini 2018
No funding received	4	Bellino 2006; Bellino 2007; Bellino 2010; Jahangard 2012
Unclear funding	9	Andreoli 2016; Bianchini 2019; Carter 2010; Kamalabadi 2012; Koons 2001a; Leppänen 2016; Mohamadizadeh 2017; Morton 2012; Turner 2000

Table 2. Key demographic characteristics of the included studies *(Continued)*

BPDSI-IV: Borderline Personality Disorder Severity Index; **BSI:** Borderline Syndrome Index; **CI-BPD:** Childhood Interview for DSM-IV Borderline Personality Disorder; **DIB:** Diagnostic Interview for Borderline Patients; **DIB-R:** Diagnostic Interview for Borderline Patients - revised version; **DIPD-IV:** Diagnostic Interview for DSM-IV Personality Disorders; **DSM-III:** Diagnostic and Statistical Manual of Mental Disorders, Third Edition; **DSM-III-R:** Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised; **DSM-IV:** Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; **DSM-IV-TR:** Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision; **ICD-10:** International Classification of Diseases, Tenth Revision; **IPDE:** International Personality Disorder Examination; **PDE:** Personality Disorders Examination; **SCID-II**: Structured Clinical Interview for DSM DSM-IV Axis II Personality Disorders (SCID-II); **SIDP-IV:** Structured Interview for DSM-IV Personality

APPENDICES

Appendix 1. DSM diagnostic criteria for BPD (301.83)

DSM - Third Edition (DSM-III;APA 1980**)**	**DSM - Fourth Edition - Text Revision (DSM-IV-TR;**APA 2000**)**	**DSM - Fifth Edition (DSM-5;** APA 2013**)**
301.83 BPD	**301.83 BPD**	**301.83 BPD**
Diagnostic criterion A		
5 of the following are required 1. Impulsivity or unpredictability in at least 2 areas that are potentially self-damaging (e.g. spending, sex, substance use, shoplifting, overeating, physically self-damaging acts) 2. A pattern of unstable and intense interpersonal relationships (e.g. marked shifts of attitude, idealisation, devaluation, manipulation (consistently using others for one's own ends)) 3. Inappropriate, intense anger or lack of control of anger (e.g. frequent displays of temper, constant anger) 4. Identity disturbance manifested by uncertainty about several issues relating to identity, such as self-image, gender identity, long-term goals or career choice, friendship patterns, values, and loyalties (e.g. 'Who am I', 'I feel like I am my sister when I am good') 5. Affective instability, marked shifts from normal mood to depression, irritability or anxiety, usually lasting a few hours and only rarely more than a few days, with a return to normal mood 6. Intolerance of being alone (e.g. frantic efforts to avoid being alone, depressed when alone)	A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and present in a variety of contexts, as indicated by 5 (or more) of the following 1. Frantic efforts to avoid real or imagined abandonment (note: do not include suicidal or self-mutilating behavior, which is covered in criterion 5) 2. A pattern of unstable and intense interpersonal relationships characterised by alternating between extremes of idealisation and devaluation 3. Identity disturbance: markedly and persistently unstable self-image or sense of self 4. Impulsivity in at least 2 areas that are potentially self-damaging (e.g. spending, sex, substance abuse, reckless driving, binge eating) (note: do not include suicidal or self-mutilating behavior, which is covered in criterion 5) 5. Recurrent suicidal behavior, gestures, or threats, or self-mutilating behavior 6. Affective instability due to a marked reactivity of mood (e.g. intense episodic dysphoria, instability, or anxiety usually lasting a few hours and only rarely more than a few days) 7. Chronic feelings of emptiness	A pervasive pattern of instability of interpersonal relationships, self-image, and affects and marked impulsivity, beginning by early adulthood and present in a variety of contexts, as indicated by 5 (or more) of the following 1. Frantic efforts to avoid real or imagined abandonment (note: do not include suicidal or self-mutilating behavior, which is covered in criterion 5) 2. A pattern of unstable and intense interpersonal relationships characterised by alternating between extremes of idealisation and devaluation 3. Identity disturbance: markedly and persistently unstable self-image or sense of self 4. Impulsivity in at least 2 areas that are potentially self-damaging (e.g. spending, sex, substance abuse, reckless driving, binge eating) (note: do not include suicidal or self-mutilating behavior, which is covered in criterion 5) 5. Recurrent suicidal behavior, gestures or threats, or self-mutilating behavior 6. Affective instability due to a marked reactivity of mood (e.g. intense episodic dysphoria, irritability or anxiety of mood) usually lasting a few hours and only rarely more than a few days 7. Chronic feelings of emptiness

(Continued)

7. Physically self-damaging acts (e.g. suicidal gestures, self-mutilation, recurrent accidents or physical fights) 8. Chronic feelings of emptiness or boredom	8. Inappropriate, intense anger or difficulty controlling anger (e.g. frequent displays of temper, constant anger, recurrent physical fights) 9. Transient, stress-related paranoid ideation or severe dissociate symptoms	8. Inappropriate, intense anger or difficulty controlling anger (e.g. frequent displays of temper, constant anger, recurrent physical fights) 9. Transient, stress-related paranoid ideation or severe dissociative symptoms
Diagnostic criterion B		
If under 18, does not meet the criteria for identity disorder	-	-

BPD: Borderline personality disorder; **DSM:** Diagnostic and Statistical Manual of Mental Disorders

Appendix 2. ICD-10 research criteria for emotionally unstable personality disorder (F60.3)

F60.30: Emotionally unstable personality disorder, impulsive type	**F60.31: Emotionally unstable personality disorder, borderline type**
Diagnostic criterion A	
The general criteria of personality disorder (F60) must be met	The general criteria of personality disorder (F60) must be met
Diagnostic criterion B	
At least 3 of the following must be present, 1 of which is 2 1. Marked tendency to act unexpectedly and without consideration of the consequences 2. Marked tendency to quarrelsome behaviour and to conflicts with others, especially when impulsive acts are thwarted or criticised 3. Liability of outbursts of anger or violence, with inability to control the resulting behavioural explosions 4. Difficulty in maintaining any course of action that offers no immediate reward 5. Unstable and capricious mood	At least 3 of the symptoms mentioned above in criterion B (F60.30) must be present, and, in addition, at least 2 of the following 6. Disturbances in, and uncertainty about, self-image, aims and internal preferences (including sexual) 7. Liability to become involved in intense and unstable relationships, often leading to emotional crises 8. Excessive efforts to avoid abandonment 9. Recurrent threats or acts of self-harm 10. Chronic feelings of emptiness

ICD-10: International Classification of Diseases, Tenth Edition

Appendix 3. Search strategies

Cochrane Central Register of Controlled Trials, in the Cochrane Library

#1 MeSH descriptor: [Borderline Personality Disorder] explode all trees
#2 borderline next state*
#3 borderline next personalit*
#4 "axis II" or "cluster B"
#5 idealization next devaluation
#6 (vulnerable or hyperbolic) next temper*

#7 (((unstab* or instab* or poor or disturb* or fail* or weak* or dysregulat*) next (self* or impuls* or interperson* or identit* or relation* or emotion* or affect*)) and (person* or character or PD))
#8 impulsiv* near personalit*
#9 (self next (injur* or damag* or destruct* or harm* or hurt* or mutilat*))
#10 suicidal next behavio?r
#11 (feel* next (empt* or bored*))
#12 (anger next control*)
#13 (risk-taking next (behavior or behaviour))
#14 #1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13

Medline Ovid

1 Borderline Personality Disorder/
2 ((borderline or border-line) adj3 (state* or personalit*)).kf,tw.
3 ("Axis II" or "Cluster B" or flamboyant or "F60.3" or "F60.30" or "F60.31").kf,tw.
4 (idealization adj5 devaluation).kf,tw.
5 ((vulnerable or hyperbolic) adj3 temperament).kf,tw.
6 (((unstab* or instab* or poor or disturb* or fail* or weak or dysregulat*) adj3 (self* or impuls* or interperson* or identit* or relationship* or emotion* or affect*)) and (personality or character or PD)).kf,tw.
7 (impulsiv* adj5 (behavio?r or character or personalit*)).kf,tw.
8 (self adj3 (injur* or damag* or destruct* or harm* or hurt* or mutilat*)).kf,tw.
9 (suicidal adj3 behavio?r).kf,tw.
10 (feel* adj3 (empt* or bored*)).kf,tw.
11 (anger adj5 control*).kf,tw.
12 (risk-taking adj3 behavio?r).kf,tw.
13 or/1-12
14 randomised controlled trial.pt.
15 controlled clinical trial.pt.
16 randomi#ed.ab.
17 placebo.ab.
18 randomly.ab.
19 trial.ab.
20 groups.ab.
21 drug therapy.fs.
22 or/14-21
23 exp Animals/ not Humans/
24 22 not 23
25 13 and 24

Embase Ovid

1 borderline state/
2 ((borderline or border-line) adj3 (personalit* or state*)).kw,tw.
3 ("Axis II" or "Cluster B" or flamboyant or "F60.3" or "F60.30" or "F60.31").kw,tw.)
4 (idealization adj5 devaluation).kw,tw.
5 ((vulnerable or hyberbolic) adj3 temperament).kw,tw.
6 (((unstab* or instab* or poor or disturb* or fail* or weak or dysregulat*) adj3 (self* or impuls* or interperson* or identit* or relationship* or emotion* or affect*)) and (personality or character or PD)).kw,tw.
7 (impulsiv* adj5 (behavio?r or character or personalit*)).kw,tw.
8 (self adj3 (injur* or damag* or destruct* or harm* or hurt* or mutilat*)).kw,tw.
9 (suicidal adj3 (behavior or behaviour)).kw,tw.
10 (feel* adj3 (empt* or bored*)).kw,tw.
11 "anger adj5 control*".kw,tw.
12 (risk-taking adj3 (behavior or behaviour)).kw,tw.
13 or/1-12
14 randomised controlled trial/
15 double blind procedure/
16 crossover procedure/
17 single blind procedure/
18 (random* or factorial* or crossover* or cross-over* or placebo* or double-blind* or doubleblind* or single-blind* or singleblind* or assign* or allocat* or volunteer*).ab,pt,sh,de,ti.
19 or/14-18
20 13 and 19

CINAHL EBSCOhost (Cumulative Index to Nursing and Allied Health Literature

S1 (MH "Borderline Personality Disorder")
S2 TX borderline N3 (state* or personalit*)
S3 TX "Axis II" OR "Cluster B"
S4 TX idealization N3 devaluation
S5 TX ((vulnerable OR hyperbolic) N3 temperament)
S6 TX (((unstab* or instab* or poor or disturb* or fail* or weak or dysregulat*) N3 (self or impuls* or interperson* or identit* or relationship* or emotion* or affect*)) AND (person* or character or PD))
S7 TX (impulsiv* N3 (behavio?r OR character or personalit*))
S8 TX (feel* N3 (empt* OR bored*))
S9 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8
S10 (MH "randomised Controlled Trials") OR (MH "Random Assignment") OR (MH "Random Sample+")
S11 TX random* N4 (trial* OR study OR studies)
S12 TX random* N4 (allocat* OR allot* OR assign* OR basis OR divid* OR order)
S13 AB placebo*
S14 AB trial
S15 (MH "Drug Therapy+")
S16 S10 OR S11 OR S12 OR S13 OR S14 OR S15
S17 S9 AND S16

PsycINFO Ovid

1 exp Borderline Personality Disorder/
2 borderline adj3 (personalit* or state*).id,ti,ab.
3 ("Axis II" or "Cluster B").id,ti,ab.
4 (idealization adj5 devaluation).ab,id,ti.
5 ((vulnerable or hyperbolic) adj3 temperament).id,ab,ti.
6 (((unstab* or instab* or poor or disturb* or fail* or weak or dysregulat*) adj3 (self* or impuls* or interperson* or identit* or relationship* or emotion* or affect*)) and (personality or character or PD)).id,ab,ti.
7 (impulsiv* adj5 (behavio?r or character or personalit*)).id,ab,ti.
8 (self adj3 (injur* or damag* or destruct* or harm* or hurt* or mutilat*)).id,ab,ti.
9 (suicidal adj3 behavio?r).id,ab,ti.
10 (feel* adj3 (empt* or bored*)).ab,id,ti.
11 "anger adj5 control*".ab,id,ti.
12 (risk-taking adj3 behavio?r).id,ab,ti.
13 or/1-12
14 exp Clinical Trials/ (
15 (random* adj allocat*).ab.
16 randomi?ed.ab.
17 placebo.ab.
18 randomly.ab.
19 trial.ab.
20 groups.ab.
21 drug therapy.sh.
22 exp Animals/ not Humans/
23 or/14-21
24 23 not 22
25 13 and 24

ERIC EBSCOhost (Education Resources Information Center)

S23 S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22
S22 TX risk-taking N5 behaviour
S21 TX anger N5 control*
S20 TX feel* N3 (empt* or bored*)
S19 TX suicidal N3 behavior
S18 TX ((unstab* or instab* or poor or disturb* or fail* or weak or dysregulat*) N3 TX (self or impuls* or interperson* or identit* or relationship* or emotion* or affect*)) AND TX (personality OR character OR PD)
S17 AB (self AND (injur* or damag* or destruct* or harm or hurt* or mutilat*))
S16 AB impulsivity
S15 TI impulsivity
S14 TX impulsiv* N3 person*
S13 TX "Axis II" OR "Cluster B"

S12 TX borderline N3 state
S11 TX borderline personality
S10 S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9
S9 AB drug
S8 AB trial
S7 AB randomly
S6 AB placebo
S5 AB randomi?ed
S4 AB controlled clinical trial*
S3 SU controlled clinical trial
S2 TX controlled clinical trial
S1 DE "randomised Controlled Trials"

BIOSIS Previews Web of Science Clarivate Analytics (1969 to 20 March 2019)

#1 TOPIC: (borderline personality disorder)
#2 TOPIC: ((borderline NEAR/3 (state))
#3 TOPIC: ((borderline NEAR/3 personalit*))
#4 TOPIC: (("Axis II" OR "Cluster B"))
#5 TOPIC: (idealization NEAR/5 devaluation)
#6 TOPIC: ((vulnerable OR hyperbolic) NEAR/3 temperament*)
#7 TOPIC: (impulsiv* NEAR/5 personalit*)
#8 TOPIC: ((self NEAR/3 (injur* OR damag* OR destruct* OR harm* OR hurt* OR mutilat*)))
#9 TOPIC: ((((unstab* OR instab* OR poor OR disturb* OR fail* OR weak OR dysregulat*) NEAR/3 (self* OR impuls* OR interperson* OR identit* OR relationship* OR emotion* OR affect*)) AND (personality OR character OR PD)))
#10 TOPIC: (suicidal NEAR/3 behavio?r)
#11 TOPIC: (((feel* NEAR/3 (empt* OR bored*))))
#12 TOPIC: ((anger NEAR/5 control*))
#13 TOPIC: (risk-taking NEAR/3 behavio?r)
#14 #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1
#15 TOPIC: (controlled clinical trial)
#16 TOPIC: (randomised controlled trial)
#17 #16 OR #15
#18 #17 AND #14

Web of Science Core Collection Clarivate Analytics

#18 #17 AND #14
#17 #16 OR #15
#16 TOPIC: (controlled clinical trial)
#15 TOPIC: (randomised controlled trial)
#14 #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1
#13 TITLE: ((risk-taking NEAR/3 behavio?r))
#12 TOPIC: ((risk-taking NEAR/3 behavio?r))
#11 TITLE: ((anger NEAR/5 control*))
#10 TOPIC: ((feel* NEAR/3 (empt* OR bored*)))
#9 TITLE: ((feel* NEAR/3 (empt* OR bored*)))
#8 TITLE: (suicidal NEAR/3 behavio?r)
#7 TITLE: (impulsivity)
#6 TOPIC: ((((unstab* OR instab* OR poor OR disturb* OR fail* OR weak OR dysregulat*) NEAR/3 (self* OR impuls* OR interperson* OR identit* OR relationship* OR emotion* OR affect*)) AND (personality OR character OR PD)))
#5 TOPIC: ((vulnerable or hyperbolic) NEAR/3 temperament)
#4 TOPIC: ((idealization NEAR/5 devaluation))
#3 TOPIC: ("axis II" OR "Cluster B")
#2 TOPIC: (borderline NEAR/3 state)
#1 TOPIC: (borderline personality disorder)

Sociological Abstracts ProQuest

(((randomised controlled trial) OR (controlled clinical trial) OR SU.exact("CLINICAL TRIALS")) OR AB(randomi?ed) OR AB(randomly) OR AB(placebo) OR AB(trial)) AND ((borderline personality) OR "axis II" OR "Cluster B" OR (idealization AND devaluation) OR ((vulnerable OR hyperbolic) AND temperament) OR (((unstab* OR instab* or poor or disturb* or fail* or weak or dysregulat*) AND (self* or impuls* or interperson* or identit* or relationship* or emotion* or affect*)) AND (personality OR character OR PD)) OR (self AND (injur* OR damag* OR destruct* OR harm OR hurt* OR mutilat*)) OR "suicidal behavio?r" OR "self destructive behavio?r" OR (feel* AND (empt* OR bored*)))

LILACS (Latin American and Caribbean Health Science Information Database)

"Borderline personality disorder", limits: Controlled clinical study

ProQuest Dissertations A&I

(SU(borderline personality disorder) OR AB("Axis II") OR AB("Cluster B")) AND (("randomised controlled study" OR "controlled clinical study") OR AB(randomi?ed) OR AB(placebo) OR AB(randomly))

OpenGrey:

"Borderline personality disorder"

NDLTD

"Borderline personality disorder"

DART Europe E-theses portal

"Borderline personality disorder"

ANZCTR

"Borderline personality disorder"

ClinicalTrials.gov

"Borderline personality disorder"

ISRCTN

"Borderline personality disorder"

WHO ICTRP:

"Borderline personality disorder"

UK Clinical Trials Gateway

"Borderline personality disorder"

EU Clinical Trials Register

"Borderline personality disorder"

Library HubDiscover (previously COPAC)

"Borderline personality disorder"

Appendix 4. Table of outcomes

Primary outcomes

1. BPD symptom severity

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Checklist - 40	BDP-40	SR	Bos 2010
Borderline Evaluation of Severity over Time	BEST	SR	Blum 2008 (12-month follow-up data); Gratz 2006; Gratz 2014; Gregory 2008b; Morton 2012
Borderline Personality Disorder Features Scale	BPDFS	SR	Lin 2019

(Continued)

Borderline Personality Features Scale for Children	BPFS-C	SR	Rossouw 2012b
Borderline Personality Inventory	BPI	SR	Leichsenring 2016
Borderline Personality Disorder Severity Index - 4th Edition	BPDSI-IV	CR	Bellino 2010; Giesen-Bloo 2006; Kamalabadi 2012; Laurenssen 2018; Leppänen 2016; Nadort 2009; Philips 2018; Sinnaeve 2018
Borderline Personality Disorder Severity Index - 4th Edition for adolescents	BPDSI-IV-adol	CR	Schuppert 2012
Borderline Syndrome Index	BSI	SR	Farrell 2009
Borderline Symptom List - 23 items	BSL-23	SR	Carmona í Farrés 2019; Elices 2016; Feliu-Soler 2017; McMain 2017; Kramer 2014; Pascual 2015; Schilling 2018
Clinical Global Impression scale for Borderline Personality Disorder patients	CGI-BPD	CR	Amianto 2011; Soler 2009
International Personality Disorder Examination - Borderline Personality Disorder criteria	IPDE-BPD	CR	Bohus 2013
Millon Adolescent Clinical Inventory	MACI	CR	Santisteban 2015
Personality Assessment Inventory - Borderline Scale	PAI-BOR	SR	Morey 2010
Structured Clinical Interview for DSM-IV Axis II Personality Disorders, Number of borderline criteria met	SCID-II, Number of borderline criteria met	CR	Doering 2010; Jørgensen 2013; Koons 2001a; Kredlow 2017a; Kredlow 2017b
Structured Clinical Interview for DSM-IV Axis II Personality Disorders, Still meeting borderline criteria	SCID-II, Still meeting borderline criteria	CR	Davidson 2006
Zanarini Rating Scale for Borderline Personality Disorder	ZAN-BPD	CR	Bateman 1999; Blum 2008 (post-treatment data); Gratz 2014; McMain 2009; Priebe 2012; Reneses 2013; Robinson 2016; Zanarini 2018

2. Self-harm

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, Parasuicidal Behaviour	BPDSI-IV, parasuicidal behaviour	CR	Bellino 2010

(Continued)

Cornell Interview for Suicidal and Self-Harming Behavior-Self-Report	CISSB	SR	Doering 2010
Days of self-harm and type of deliberate self-harm were recorded in an interview on a structured form	None	None	Priebe 2012
Deliberate Self-Harm Inventory	DSHI	SR	Gratz 2006; Gratz 2014; McMain 2017
Deliberate Self-Harm Inventory - Short Form	DSHI-SF	SR	Philips 2018
Deliberate Self-Harm Inventory - participants with self-harm during previous 12 months	DSHI - participants with self-harm	SR	Davidson 2006
Lifetime Parasuicide Count - Self-Mutilative Accts	LPC	CR	Gregory 2008b; Sinnaeve 2018; Van den Bosch 2005
Number of self-harming incidents during previous 12-month period	Unclear	Unclear	Amianto 2011
Number of self-harming acts during previous three-month period	Unclear	Unclear	Carter 2010
Suicide and Self-Harm Inventory - number of patients with self-harming behaviour during previous six-month period	SSHI - patients with self-harm	CR	Bateman 1999; Bateman 2009
Personality Assessment Inventory, Borderline Features Scale - Self-Harm	PAI-BOR-S	SR	Morey 2010
Parasuicide History Interview - deliberate self-harm frequency	PHI - deliberate self-harm frequency	CR	Koons 2001a; Weinberg 2006
Parasuicide History Interview - patients with self-harming behaviour during previous 12-month period	PHI - patients with self-harm	CR	Linehan 1991
Risk-Taking and Self-Harm Inventory - participants with self-harming behaviour	RTSHI - patients with self-harm	SR	Rossouw 2012b
Suicide Attempt and Self-Injury Interview, Non-Suicidal Self-Injury scale	SASII - NSSI/self-harm	CR	Feigenbaum 2012; Harned 2014; Linehan 2006; Linehan 2015a;
Suicide Attempt and Self-Injury Interview - number of suicidal and self-injurious episodes	SASII - suicidal and self-injurious episodes	CR	McMain 2009
Self-Harming Behaviours Checklist	SHBCL	CR	Cottraux 2009
Self-Harm Questionnaire - number of suicidal and self-injurious episodes	SHQ - suicidal and self-injurious episodes	SR	Borschmann 2013
Target Behaviour Rating - frequency of parasuicide	TBR - frequency of parasuicide	CR	Turner 2000

3. Suicide-related outcomes

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
The 12-item Adult Suicidal Ideation Questionnaire— Shortened Version	ASIQ-S	SR	Lin 2019
Beck Hopelessness Scale	BHS	SR	Cottraux 2009
Beck Scale for Suicidal Ideation	BSS	SR	Davidson 2014; Koons 2001a; Mohamadizadeh 2017; Turner 2000
Clinical Global Impression scale for Borderline Personality Disorder patients, suicidality	CGI-BPD, Suicidality	CR	Amianto 2011; Soler 2009
Deliberate Self-Harm Inventory, suicide attempts (cumulative average)	DSHI, Suicide Attempts (cumulative average)	CR	Davidson 2006
Lifetime Suicide Attempt Self-Injury Interview	LSASI	CR	McMain 2017; Reneses 2013
Number of participants with suicide attempt (recorded via direct contact with patients and health care staff, as well as from reviewing the case records)	None	CR	Philips 2018
Number of suicide attempts	None	None	Stanley 2017
Personality Assessment Inventory - suicidal ideation	PAI-SI	SR	Morey 2010
Borderline Personality Disorder Severity Index - 4th Edition, parasuicidality, suicide plans and attempts	BPDSI-IV, parasuicidality, suicide plans and attempts	CR	Leppänen 2016
Suicidal Behaviours Questionnaire	SBQ	SR	Weinberg 2006
Suicidal Ideation Questionnaire - Junior	SIQ-JR	SR	Mehlum 2014
Suicide attempt and self-injury interview, suicide attempts	SASII, suicide attempts	CR	Feigenbaum 2012; Harned 2014; Linehan 2006; Linehan 2015a
Self-Harm Inventory (number of participants with life-threatening suicide attempts in the last 6 months)	SSHI	CR	Bateman 1999; Bateman 2009
Overt Aggression Scale - Modified for outpatients, suicidality	OAS-M, suicidality	CR	Gleeson 2012
Borderline Personality Disorder Severity Index, parasuicidal	BPDSI, parasuicidal	CR	Kamalabadi 2012

4. Psychosocial functioning

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Brief Disability Questionnaire, days out of role	BDQ, days out of role	SR	Carter 2010
Children's Global Assessment Scale[a]	C-GAS	CR	Mehlum 2014
Clinical Global Impressions scale - severity of illness	CGI-S	CR	Bellino 2006; Bellino 2010; Cottraux 2009;
Clinical Global Impressions scale - improvement - self-rated	CGI-I-SR	SR	Soler 2009
Dutch version of the Health of the Nations Outcome Scales	HoNOS	CR	Jochems 2015
Clinical Outcomes in Routine Evaluation – outcome measure, Functioning subscale	CORE-OM, Functioning subscale	SR	Feigenbaum 2012
Global Assessment of Functioning scale[a]	GAF	CR	Amianto 2011; Antonsen 2017; Bohus 2013; Doering 2010; Farrell 2009; Kredlow 2017b; Robinson 2016; Salzer 2014
Global Assessment Scale[a]	GAS	CR	Andreoli 2016; Blum 2008; Harned 2014; Linehan 1994
General Health Questionnaire, functioning	GHQ, functioning	CR	Kamalabadi 2012
Outcome Questionnaire—45.2, social role	OQ45, social role	SR	Haeyen 2018; Kramer 2011; Kramer 2014; Kramer 2016
Social Functioning Questionnaire	SFQ	SR	Davidson 2006; McMurran 2016
Sheehan Disability Scale	SDS	SR	Gratz 2014; Zanarini 2018
Social Adjustment Scale - self-rating	SAS-SR	SR	Bateman 1999; Bateman 2009; Jørgensen 2013; McMain 2017; Reneses 2013
Satisfaction Profile, social functioning	None	SR	Bellino 2010
Social and Occupational Functioning Assessment Scale[a]	SOFAS	CR	Bellino 2007; Gleeson 2012
Social Provisions Scale - "How many days were you paid for working in the past 30 days?"[a]	SPS - days paid for working	SR	Gregory 2008b
Total Outcome Questionnaire 45	OQ45	SR	Haeyen 2018
Work and Social Adjustment Scale	WSAS	SR	Borschmann 2013

[a]For these scales, higher scores indicate better functioning, as opposed to most other clinical outcome scales (where higher scores indicate higher burden). Scores were multiplied by (−1) before entering for effect size calculation, to ensure that a negative direction of effect indicates a beneficial effect (like for most other clinical outcomes).

Secondary outcomes

1. Anger

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Anger Irritability and Assault Questionnaire, Labile Anger subscale	AIAQ, Labile Anger subscale	SR	Gleeson 2012
Borderline Personality Disorder Severity Index - 4th Edition, anger	BPDSI-IV, anger	CR	Bellino 2010; Kamalabadi 2012; Leppänen 2016
Clinical Global Impression scale for Borderline Personality Disorder patients, anger	CGI-BPD, anger	CR	Amianto 2011; Soler 2009
Overt Aggression Scale - Modified, labile anger	OAS-M, labile anger	CR	Gleeson 2012
Spielberger Anger Expression Scale, anger out	STAXI, anger out	SR	Feigenbaum 2012; Koons 2001a; Linehan 2006; McMain 2009
Spielberger Anger Expression Scale, trait anger	STAXI, trait anger	SR	Linehan 1994; McMain 2017
Target Behaviour Rating, anger	TBR, anger	CR	Turner 2000

2. Affective instability

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, affective instability	BPDSI-IV, affective instability	CR	Bellino 2010; Kamalabadi 2012; Leppänen 2016
Borderline Personality Disorder Severity Index - 4th Edition for adolescents, affective instability	BPDSI-IV-adol, affective instability	CR	Schuppert 2012
Clinical Global Impression scale for Borderline Personality Disorder patients, affective instability	CGI-BPD, affective instability	CR	Amianto 2011; Soler 2009
Revised Diagnostic Interview for Borderlines, Affect subscale	DIB-R, Affect subscale	CR	Farrell 2009
Difficulties in Emotion Regulation Scale, Total score	DERS, Total score	SR	Bianchini 2019; Gratz 2006; Gratz 2014; Mc-

(Continued)

			Main 2017; Morton 2012
Personality Assessment Inventory, affective instability	PAI-BOR-A, affective instability	SR	Morey 2010
Strengths and Difficulties Questionnaire, emotional problems	SDQ, emotional problems	SR	Salzer 2014
Zanarini Rating Scale for Borderline Personality Disorder, affective instability	ZAN-BPD, affective instability	CR	Blum 2008; Reneses 2013; Zanarini 2018

3. Chronic feeling of emptiness

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, emptiness	BPDSI-IV, emptiness	CR	Bellino 2010; Kamalabadi 2012; Leppänen 2016
Clinical Global Impression scale for Borderline Personality Disorder patients, emptiness	CGI-BPD, emptiness	CR	Amianto 2011; Soler 2009
Zanarini Rating Scale for Borderline Personality Disorder, feeling of emptiness	Zan-BPDf, feeling of emptiness	CR	Reneses 2013

4. Impulsivity

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Barrett Impulsiveness Scale	BIS	SR	Bianchini 2019, McMain 2017; Pascual 2015
Barrett Impulsiveness Scale - 11, non-planning	BIS-11, non-planning	SR	Carmona í Farrés 2019; Elices 2016
Borderline Personality Disorder Severity Index - 4th Edition, impulsivity	BPDSI-IV, impulsivity	CR	Bellino 2010; Kamalabadi 2012; Leppänen 2016; Van den Bosch 2005
Clinical Global Impression scale for Borderline Personality Disorder patients, impulsivity	CGI-BPD, impulsivity	CR	Amianto 2011; Soler 2009
Diagnostic Interview for Borderline Personality Disorder - Revised, impulsive	DIB-R, impulsive	CR	Farrell 2009

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Difficulties in Emotion Regulation Scale, impulsive dyscontrol	DERS, impulse dyscontrol	SR	Gratz 2006; Gratz 2014
Eysenck Impulsivity Venturesomeness Empathy Questionnaire, impulsivity	IVE, impulsivity	SR	Cottraux 2009
Target Behaviour Rating, impulsiveness	TBR, impulsiveness	CR	Turner 2000
Zanarini Rating Scale for Borderline Personality Disorder, impulsivity	ZAN-BPD, impulsivity	CR, SR	Blum 2008; Reneses 2013; Robinson 2016; Zanarini 2018

5. Interpersonal problems

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, interpersonal relationships	BPDSI-IV, interpersonal relationships	CR	Bellino 2010; Kamalabadi 2012
Borderline Personality Disorder Severity Index - 4th Edition, unstable relationships	BPDSI-IV, unstable relationships	CR	Leppänen 2016
Clinical Global Impression scale for Borderline Personality Disorder patients, unstable relations	CGI-BPD, unstable relations	CR	Amianto 2011; Soler 2009
Circumplex of Interpersonal Problems	CIP	SR	Antonsen 2017
Revised Diagnostic Interview for Borderlines, Interpersonal subscale	DIB-R, Interpersonal subscale	CR	Farrell 2009
EQ-5D Health-Related Quality of Life Questionnaire, social relationships	EQ-5D, social relationships	SR	Robinson 2016
Inventory of Interpersonal Problems - Borderline Personality Disorder, Related composite	IIP-BPD, Related composite	SR	Gratz 2014
Inventory of Interpersonal Problems - Circumflex version/64-item version	IIP-C/IIP-64	SR	Bateman 1999; Bateman 2009; Jørgensen 2013; Laurenssen 2018; Leichsenring 2016; McMain 2009; Philips 2018
Inventory of Interpersonal Problems - 25-item version	IIP-25	SR	Harned 2014
Inventory of Interpersonal Problems Short Circumplex - 32-item version	IIP-SC/IIP-32	SR	Davidson 2006
Outcome Questionnaire 45, interpersonal relations	OQ45, interpersonal relations	SR	Haeyen 2018; Kramer 2011; Kramer 2014; Kramer 2016

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Personality Assessment Inventory - Borderline Features Scale - negative relationships	PAI-BOR-N	SR	Morey 2010
Strengths and Difficulties Questionnaire, problems in relationships	SDQ, problems in relationships	SR	Salzer 2014
Abbreviated World Health Organization Quality of Life Questionnaire, Social relationships score	WHOQOL-Bref, Social relationships score	SR	Bos 2010; Carter 2010
Zanarini Rating Scale for Borderline Personality Disorder, disturbed relationships	ZAN-BPD, disturbed relationships	CR	Blum 2008; Reneses 2013; Zanarini 2018

6. Abandonment

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, abandonment	BPDSI-IV, abandonment	CR	Bellino 2010; Kamalabadi 2012; Leppänen 2016
Clinical Global Impression scale for Borderline Personality Disorder patients, fear of abandonment	CGI-BPD, fear of abandonment	CR	Amianto 2011

7. Identity disturbance

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, identity disturbance	BPDSI-IV, identity disturbance	CR	Bellino 2010; Kamalabadi 2012; Leppänen 2016
Borderline Personality Inventory, identity diffusion	BPI, identity diffusion	SR	Leichsenring 2016
Clinical Global Impression scale for Borderline Personality Disorder patients, identity distortion	CGI-BPD, identity distortion	CR	Amianto 2011
Personality Assessment Inventory - Borderline Features Scale - identity disturbance	PAI-BOR-I	SR	Morey 2010
Severity Indices of Personality Problems	SIPP	SR	Antonsen 2017
Zanarini Rating Scale for Borderline Personality Disorder, Identity subscale	Zan-BPD, Identity subscale	CR	Reneses 2013

8. Dissociation and psychotic-like symptoms

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Borderline Personality Disorder Severity Index - 4th Edition, paranoid ideation	BPDSI-IV, paranoid ideation	CR	Bellino 2010; Leppänen 2016
Borderline Personality Disorder Severity Index - 4th Edition, dissociation	BPDSI-IV, dissociation	CR	Kamalabadi 2012
Brief Psychiatric Rating Scale	BPRS	CR	Gleeson 2012; Kredlow 2017a; Soler 2009; Turner 2000
Clinical Global Impression scale for Borderline Personality Disorder patients, dissociative symptoms	CGI-BPD, dissociative symptoms	CR	Amianto 2011
Revised Diagnostic Interview for Borderlines, Cognitive subscale	DIB-R, Cognitive subscale	CR	Farrell 2009
Dissociative Experiences Scale	DES	SR	Bohus 2013; Feigenbaum 2012; Gregory 2008b; Koons 2001a
Dissociative Experiences Scale - Taxon	DES-T	SR	Harned 2014
Zanarini Rating Scale for Borderline Personality Disorder, cognitive	Zan-BPD, cognitive	CR	Blum 2008

9. Depression

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Beck Depression Inventory	BDI	SR	Antonsen 2017; Bateman 1999; Bateman 2009; Blum 2008; Cottraux 2009; Doering 2010; Gregory 2008b; Koons 2001a; Laurenssen 2018; Leichsenring 2016; McMain 2009; Schilling 2018; Turner 2000
Beck Depression Inventory-II	BDI-II	SR	Bohus 2013; Davidson 2006; Feigenbaum 2012; Jørgensen 2013; Kredlow 2017a; Kredlow 2017b; McMain 2017; Mohamadizadeh 2017
Depression Anxiety Stress Scales	DASS	SR	Gratz 2006; Gratz 2014; Morton 2012
Depression Anxiety Stress Scale - 21	DASS-21	SR	Robinson 2016

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Diagnostic Interview Schedule for Children – Predictive Scales	DISC - PS	SR	Santisteban 2015
General Health Questionnaire, Depression subscale	GHQ, Depression subscale	SR	Kamalabadi 2012
Hamilton Depression Inventory	Ham-D	CR	Bellino 2006; Bellino 2007; Bellino 2010; Smith 2012
Hamilton Depression Inventory - 17-item	Ham-D-17	SR, CR	Linehan 2006; Soler 2009
Hamilton Depression Rating Scale	HDRS	SR	Andreoli 2016; Harned 2014; Jahangard 2012; Linehan 2015a
Hamilton Depression and Anxiety Scale	HADS	SR	Borschmann 2013; Davidson 2014; McMurran 2016
Ko's Depression Inventory	None	SR	Lin 2019
Montgomery Åsberg Depression Rating Scale	MADRS	CR	Gleeson 2012; Mehlum 2014; Pascual 2015; Reneses 2013
Mood and Feelings Questionnaire - participants scoring higher than cut-off for depression	MFQ - above cut-off	SR	Rossouw 2012b
Clinically Useful Depression Outcome Scale, total score	None	SR	Zanarini 2018

10. Adverse effects

Name of scale/means of assessment	Abbreviation	Clinician-rated (CR)/self-rated (SR)	Study
Spontaneous reporting	-	-	Andreoli 2016; Davidson 2014; Haeyen 2018; Leichsenring 2016; McMurran 2016; Pascual 2015; Robinson 2016; Stanley 2017 The remaining trials did not report adverse effects

Appendix 5. 'Risk of bias' components and criteria for assigning judgements

Selection bias

Random sequence generation

1. **Low risk of bias:** The method used was adequate (e.g. computer-generated random numbers, table of random numbers) or was unlikely to introduce selection bias.
2. **Unclear risk of bias:** The information was insufficient for the assessment of whether the method used could introduce selection bias.
3. **High risk of bias:** The method used was likely to introduce bias.

Allocation concealment

1. **Low risk of bias:** The method used (e.g. central allocation) was unlikely to bias allocation to groups.
2. **Unclear risk of bias:** The information was insufficient for assessment of whether the method used could bias allocation to groups.
3. **High risk of bias:** The method used (e.g. open random allocation schedule) could bias allocation to groups.

Detection bias: blinding of outcome assessment

1. **Low risk of bias:** The method of blinding was described and blinding was conducted in a satisfactory way.
2. **Unclear risk of bias:** The information was insufficient for assessment of whether the type of blinding used was likely to bias the estimate of effect.
3. **High risk of bias:** There was no blinding or incomplete blinding.

Attrition bias: incomplete outcome data

1. **Low risk of bias:** The underlying reasons for missing data probably would not affect outcome measurement, as all missing data can be considered as missing at random or all data were reported.
2. **Unclear risk of bias:** The information was insufficient for the assessment of whether the missing data or the method used to handle missing data was likely to bias the estimate of effect.
3. **High risk of bias:** The crude estimate of effects could be biased given the reasons for the missing data, or the methods used to handle missing data are unsatisfactory.

Reporting bias: selective outcome reporting

1. **Low risk of bias:** The trial protocol was available and all prespecified outcomes of interest were reported.
2. **Unclear risk of bias:** The information was insufficient for the assessment of whether selective outcome reporting could have occurred.
3. **High risk of bias:** Not all of the primary outcomes specified beforehand were reported or participants were excluded after randomisation.

Other potential sources of bias

Treatment adherence bias

1. **Low risk of bias:** Measures were undertaken to assure adequate treatment adherence; for example, by regular supervision or use of adherence ratings of videotaped or audio-taped therapy sessions.
2. **Unclear risk of bias:** There was insufficient information to assess the extent of adequate treatment adherence.
3. **High risk of bias:** There was inadequate treatment adherence. Steps/measures were undertaken to assure adequate treatment adherence.

Attention bias

1. **Low risk of bias:** The treatment conditions were sufficiently similar in duration and intensity.
2. **Unclear risk of bias:** There was insufficient information in regards to treatment duration and intensity.
3. **High risk of bias:** One treatment condition was markedly more intense or was of longer duration than (a)nother condition(s).

Affiliation bias

1. **Low risk of bias:** The principal investigator was not the developer of the treatment under investigation (if compared to a control condition), or both treatment developers were involved if two treatments were directly compared.
2. **Unclear risk of bias:** There was insufficient information to assess affiliation bias.
3. **High risk of bias:** The principal investigator was the developer of the treatment under investigation (if compared to a control condition), or only one of the treatment developers was involved if two treatments were directly compared.

Other sources of bias

1. **Low risk of bias:** The trial appeared to be free of other sources of bias.
2. **Unclear risk of bias:** The information was inadequate for the assessment of other possible sources of bias.
3. **High risk of bias:** Other sources of bias were identified.

Appendix 6. Trial Sequential Analysis (TSA) and funnel plots figures

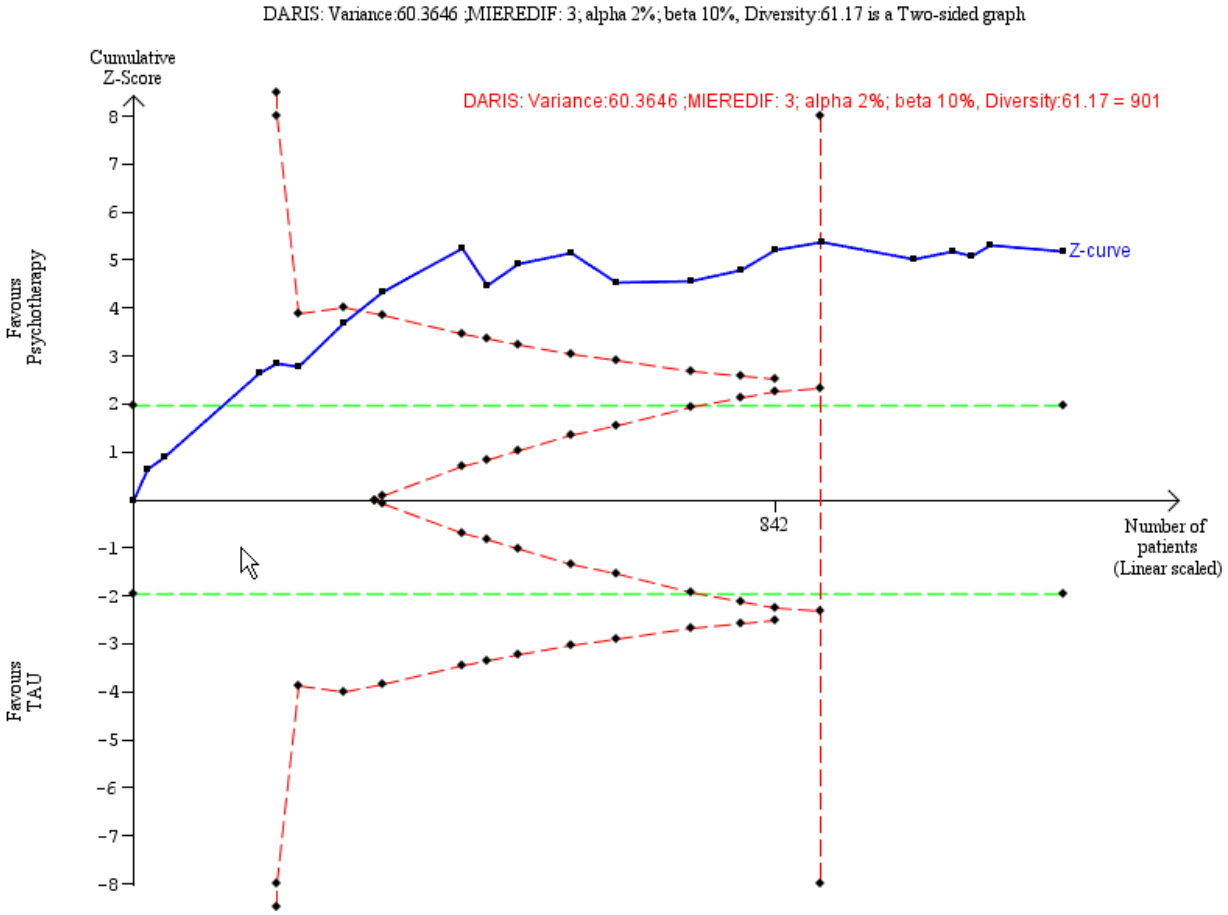
Psychotherapy versus TAU

Primary outcomes

BPD symptom severity

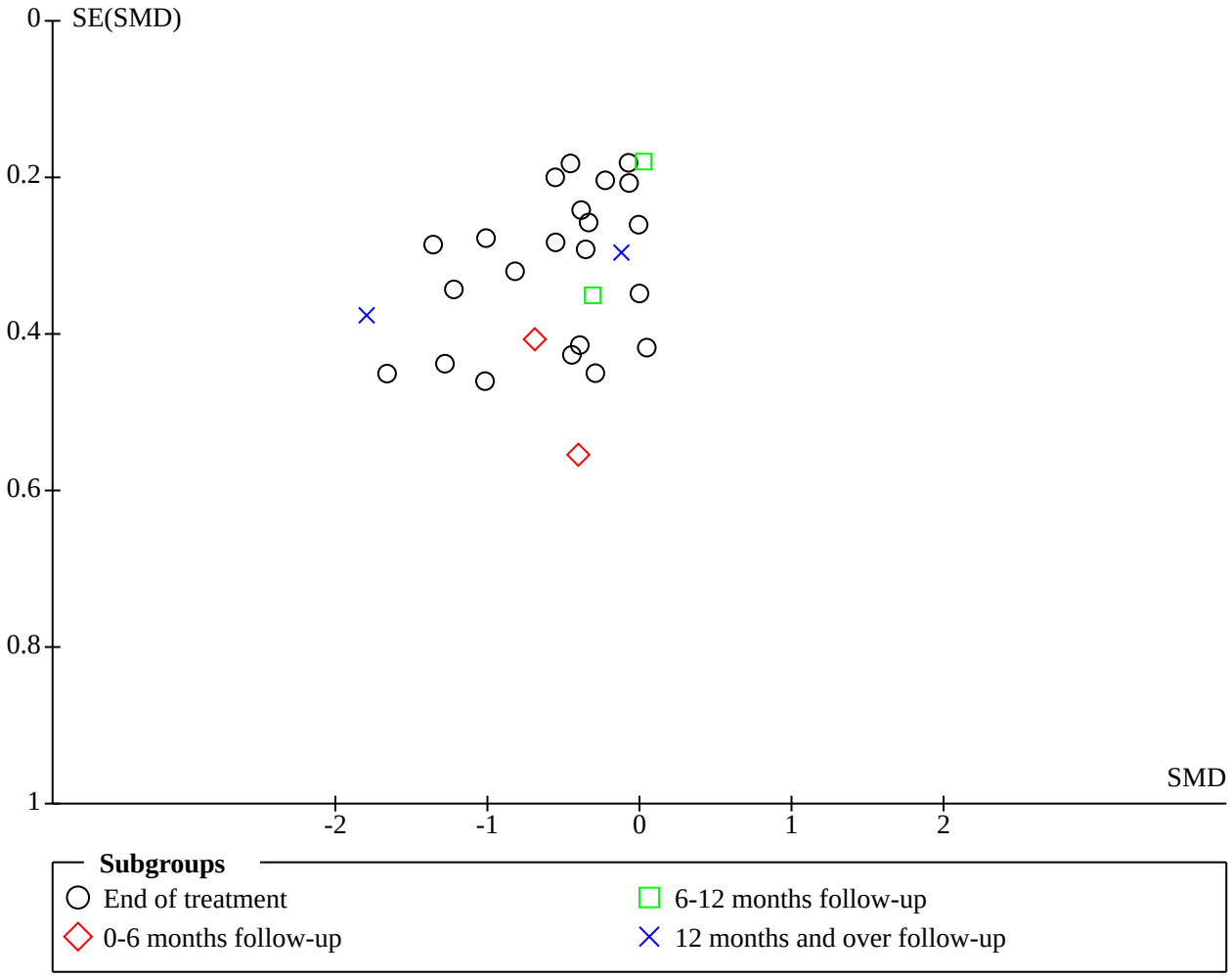
We performed a TSA on the primary outcome of borderline symptom severity at end of treatment. The analysis shows that the required information size was reached. See Figure 4 below.

Figure 4. Trial Sequential Analysis on primary outcome: Psychotherapy - borderline symptom severity at end of treatment



We drew a funnel plot for the comparison between psychotherapy and TAU for the primary outcome of BPD symptom severity. The funnel plot shows a small asymmetry. See Figure 5 below.

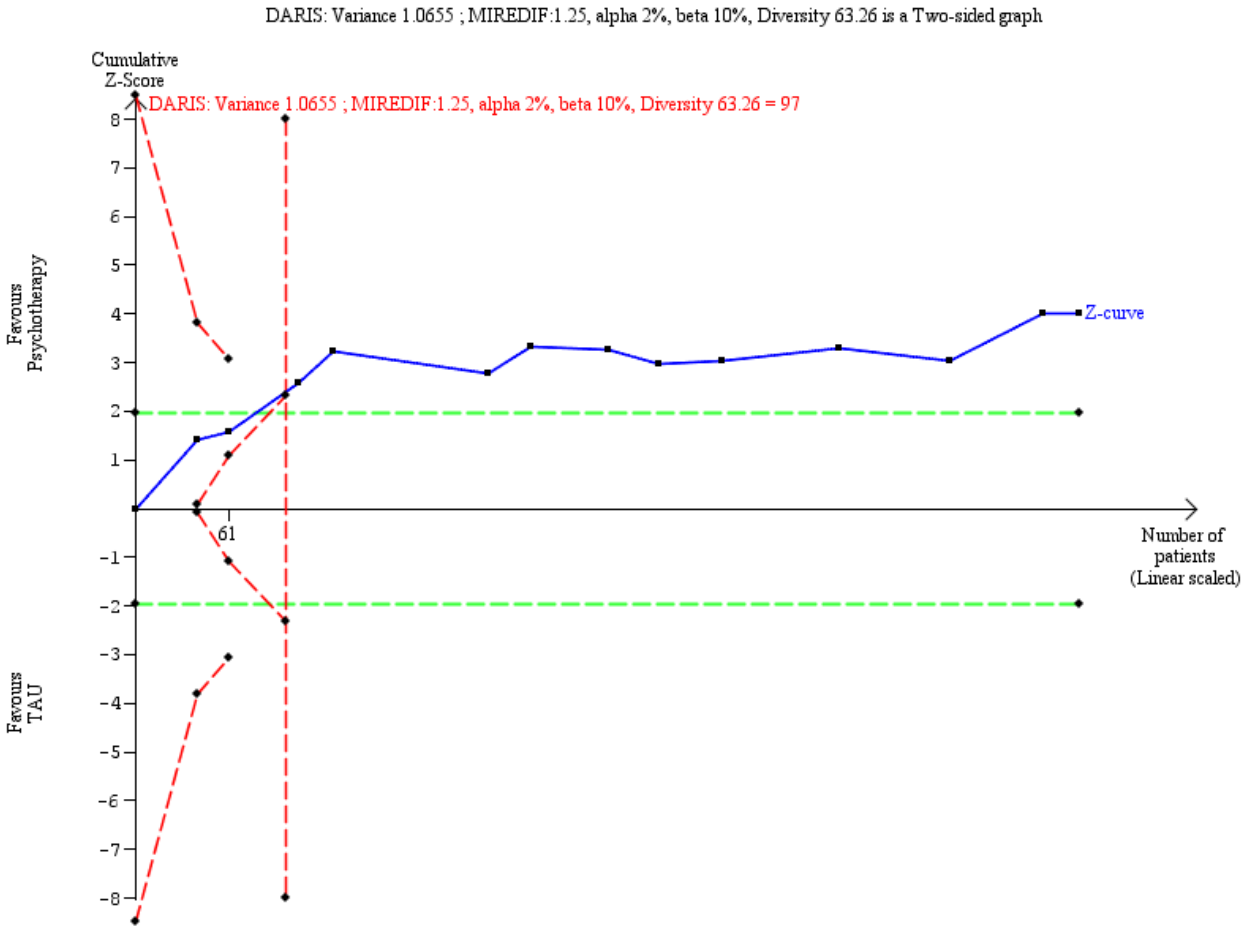
Figure 5. Funnel plot of comparison 1: Psychotherapy versus TAU, outcome: 1.1 Primary outcome: BPD symptom severity.



Self-harm

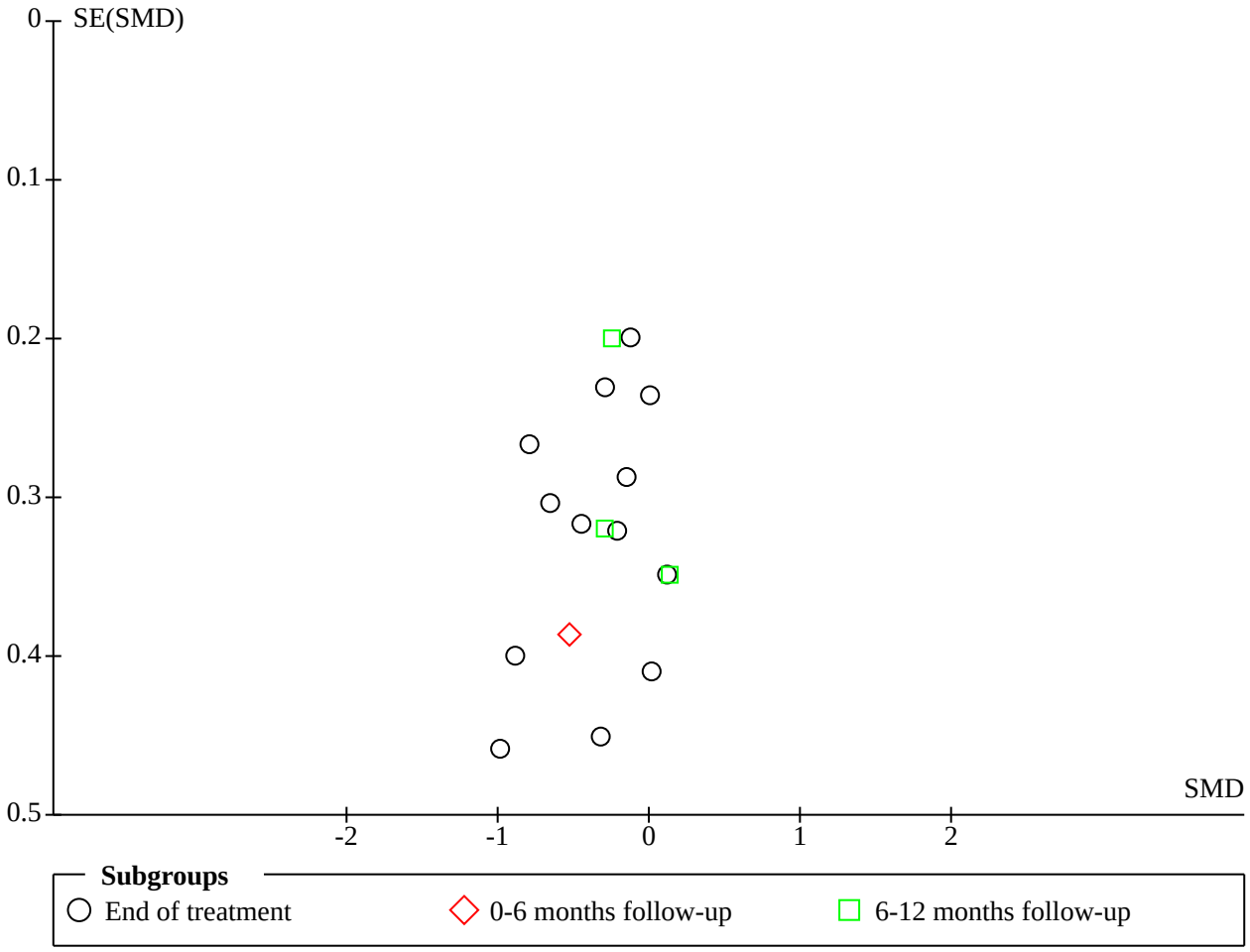
We performed a TSA on the primary outcome of self-harm at end of treatment. The analysis shows that the required information size was reached. See Figure 6 below.

Figure 6. Trial Sequential Analysis on primary outcome: Psychotherapy - self-harm at end of treatment



We drew a funnel plot for the comparison between psychotherapy and TAU for the outcome of self-harm. The funnel plot shows symmetry. See Figure 7 below.

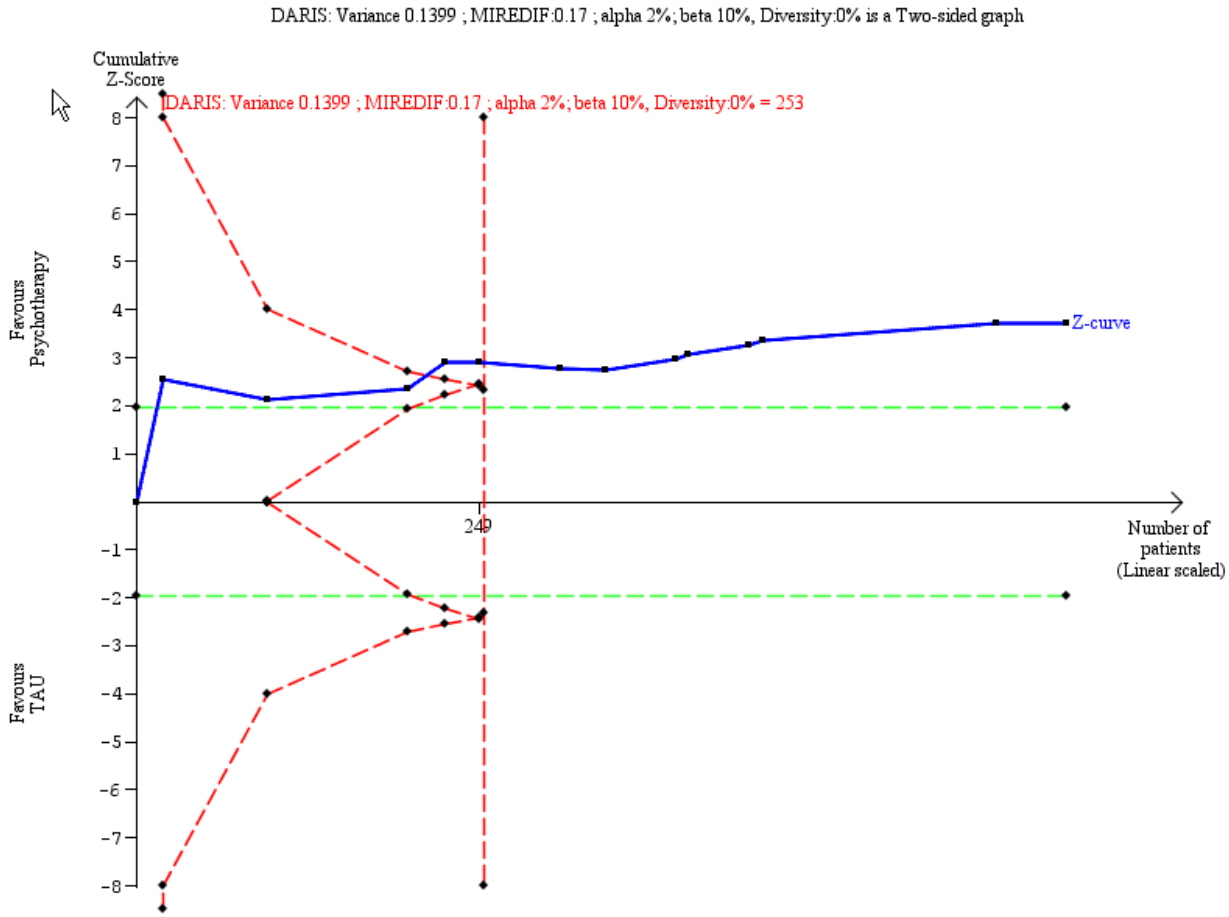
Figure 7. Funnel plot of comparison: 1 Psychotherapy versus TAU, outcome: 1.3 Primary outcome: self-harm.



Suicide-related outcomes

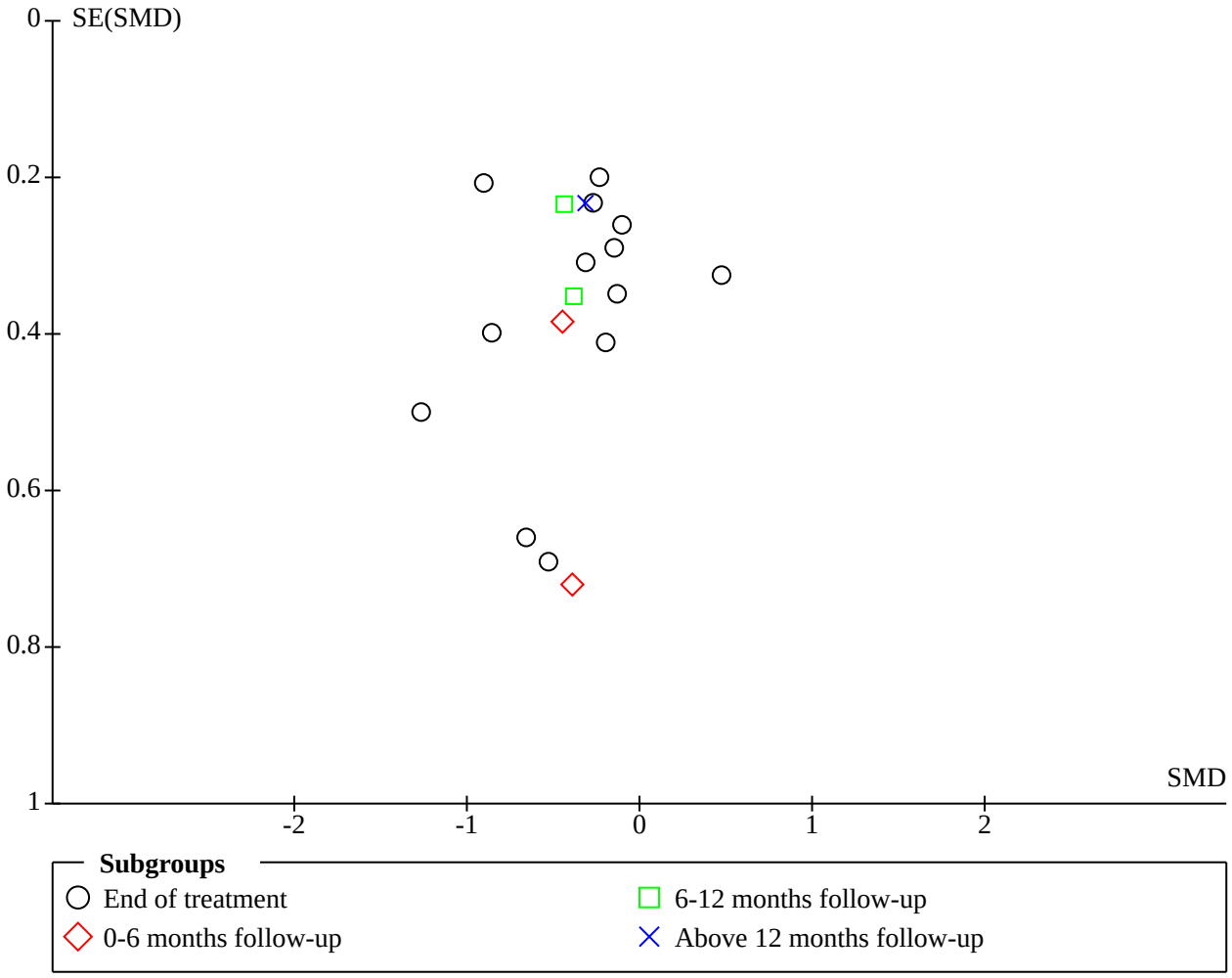
We performed a TSA on the primary outcome of suicide-related outcomes at end of treatment. The analysis shows that the required information size was reached. See Figure 8 below.

Figure 8. Trial Sequential Analysis on primary outcome: Psychotherapy - suicide-related outcomes at end of treatment



We drew a funnel plot for the comparison between psychotherapy and TAU for suicide-related outcomes. The funnel plot shows symmetry. See Figure 9 below.

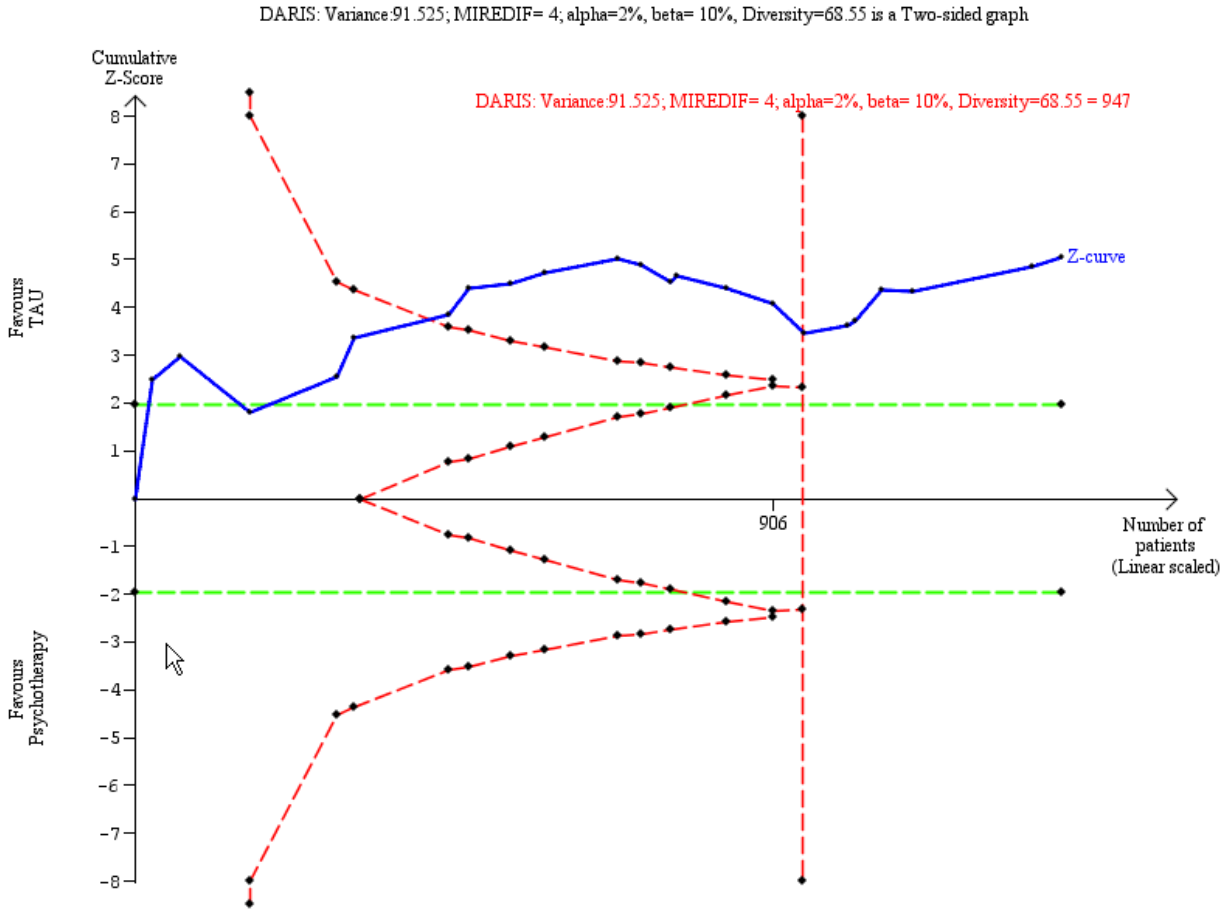
Figure 9. Funnel plot of comparison: 1 Psychotherapy compared with TAU, outcome: 1.5 Primary outcome: suicide-related outcomes.



Psychosocial functioning

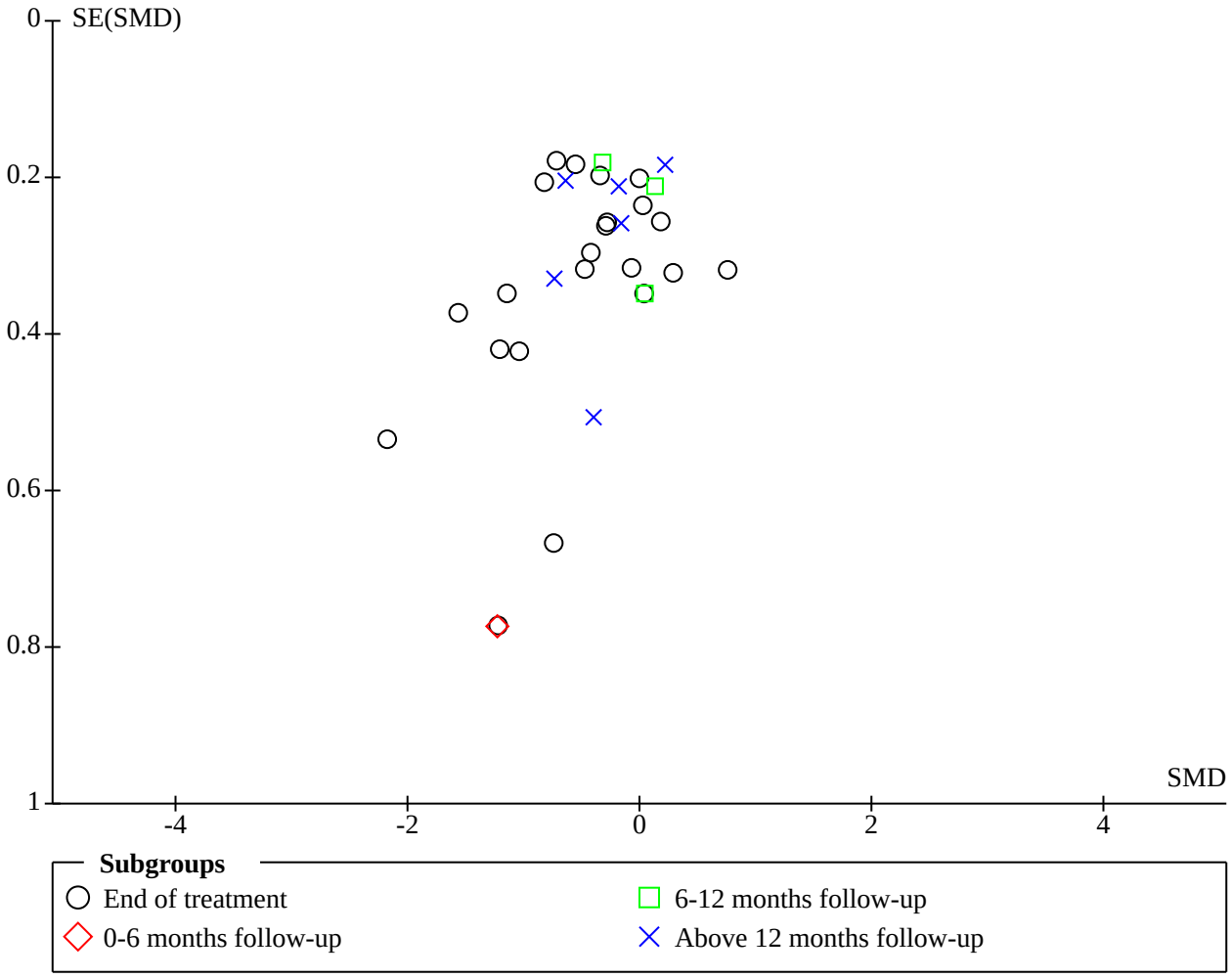
We performed a TSA on the primary outcome of psychosocial functioning at end of treatment. The analysis shows that the required information size was reached. See Figure 10 below.

Figure 10. Trial Sequential Analysis on primary outcome: Psychotherapy - psychosocial functioning at end of treatment



We drew a funnel plot for the comparison between psychotherapy and TAU for the outcome of psychosocial functioning. The funnel plot shows symmetry. See Figure 11 below.

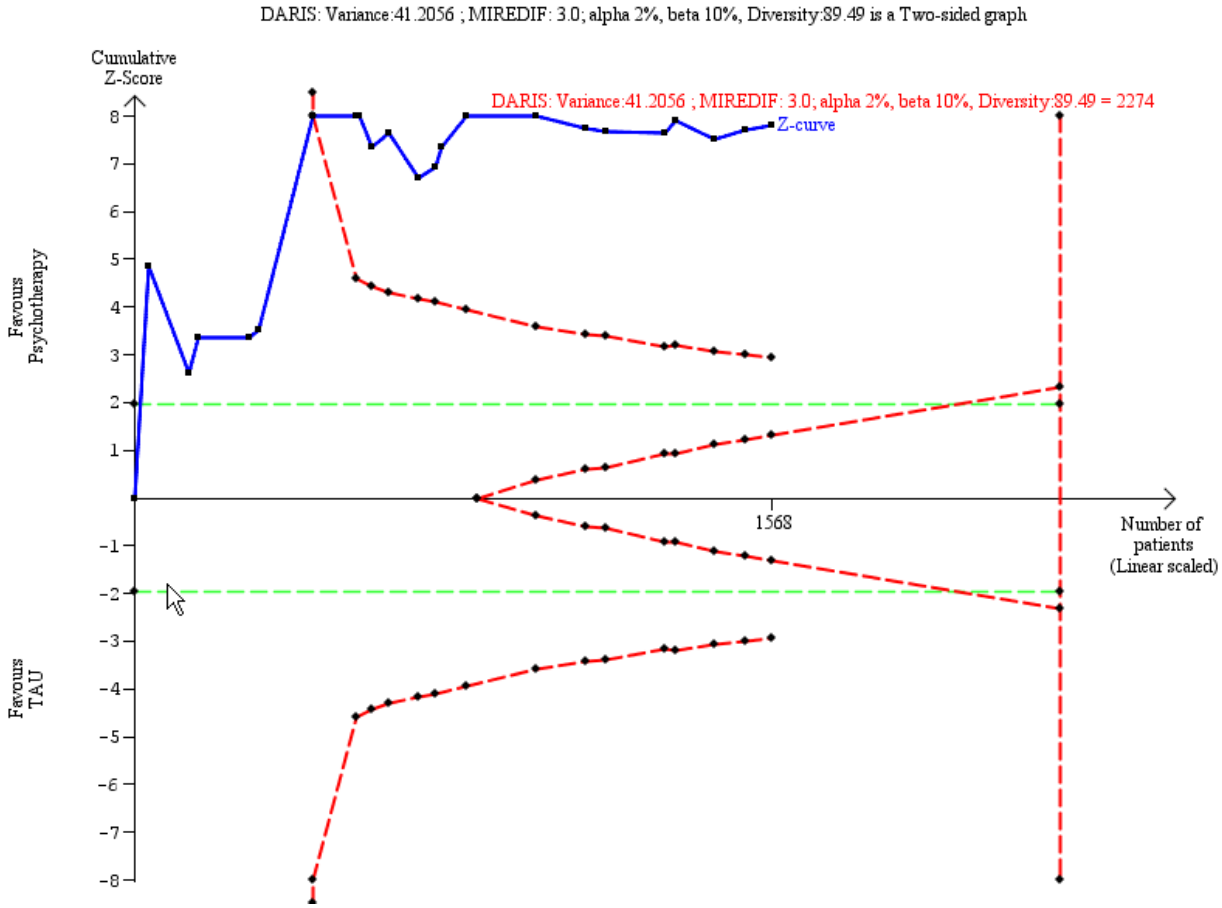
Figure 11. Funnel plot of comparison: 1 Psychotherapy compared with TAU, outcome: 1.7 Primary outcome: psychosocial functioning.



Secondary outcome: depression

We performed a TSA on the secondary outcome of depression at end of treatment. The analysis shows that the required information size was not reached. See Figure 12 below.

Figure 12. Trial Sequential Analysis on secondary outcome: Psychotherapy - depression at end of treatment



FEEDBACK

Feedback, 8 October 2020

Summary

The study 'Democratic therapeutic community treatment for personality disorder: randomised controlled trial.' published in the British Journal of Psychiatry in 2017, seems not to have been included in the review, either in the included or excluded studies. Given that it meets the criteria for inclusion, this looks like an oversight. In particular, the study included over 90% of participants suffering from Borderline Personality Disorder; it is an RCT; and it was published in one of the journals which was hand searched. It falls within the time limits of the searches carried out for the review. Authors were not approached to supply data on the subsample of participants with a Borderline Personality Disorder diagnosis. Grateful for your comments on this. Sincerely Dr S Pearce Reference: Pearce S, Scott L, Attwood G, Saunders K, Dean M, De Ridder R, Galea D, Konstandinidou H, Crawford M. Democratic therapeutic community treatment for personality disorder: randomised controlled trial. Br J Psychiatry (2017), Vol. 210, 149-156. (doi.org/10.1192/bjp.bp.116.184366).

Reply

Thank you for the comment augmenting that we should have included the trial in our Cochrane systematic review: 'Psychological therapies for people with borderline personality disorder'.

We did identify your trial (available at doi.org/10.1192/bjp.bp.116.184366) of democratic therapeutic community (DTC) in our searches, but we excluded it at the title and abstract screening stage, because the intervention is not eligible for our review. In light of your comment, we have discussed this further and have reached the same decision: that it is not eligible for the following reasons.

The intervention that you tested is a socioenvironmental therapy, because it consists of being part of a therapeutic community that is built on democratic principles (consisting of shared decision-making around group matters, discussion of behavior, feedback on behavior, shared living, creating a community and activities, etc.). Therefore, we regard it as a socioenvironmental intervention rather than psychotherapy.

In our Methods section, we wrote the following about the types of interventions to be included: "Any defined psychological intervention regardless of theoretical orientation (e.g. psychodynamic therapy, CBT, systemic therapy or eclectic therapies designed for BPD treatment), in any kind of treatment setting (e.g. inpatient, outpatient or day clinic)".

Furthermore, in our Background section (Description of the intervention), we noted that although therapeutic community can be used as an add-on therapy to psychotherapy, we would not regard it as the core therapy in itself and we have excluded trials with similar interventions (e.g. the Carta 2014 trial: 'Sailing can improve quality of life of people with severe mental disorders: results of a cross over randomized controlled trial').

Contributors

Dr S Pearce, Honorary Senior Clinical Lecturer, University of Oxford; Dr Ole Jakob Storebø, Psychiatry of Region Zealand, Denmark; Prof Mike Clarke, DPLP Feedback Editor.

WHAT'S NEW

Date	Event	Description
2 November 2020	Feedback has been incorporated	Feedback from Dr Pearce submitted via Cochrane Library on 8 October (supplied to DPLP by EMD). No change made.

HISTORY

Protocol first published: Issue 2, 2018
Review first published: Issue 5, 2020

Date	Event	Description
5 May 2020	Amended	Adding acknowledgement for peer reviewers.

CONTRIBUTIONS OF AUTHORS

Ole Jakob Storebø: protocol development; study selection; data extraction; data entry; assessment of risk of bias and GRADE; data analysis; and writing of final report

Jutta M Stoffers-Winterling: protocol development; study selection; data extraction; data entry; assessment of risk of bias and GRADE; data analysis; and writing of final report

Birgit A Völlm: protocol development; study selection; data extraction; and writing of final report

Mickey T Kongerslev: protocol development; study selection; data extraction; assessment of risk of bias; and writing of final report

Jessica T Mattivi: protocol development; study selection; data extraction; and writing of final report

Mie Sedoc Jørgensen: study selection; data extraction; assessment of risk of bias; and writing of final report

Erlend Faltinsen: study selection; data extraction; data entry; assessment of risk of bias; data analysis; and writing of final report

Adnan Todorovac: study selection; data extraction; data entry; assessment of risk of bias; data analysis; and writing of final report

Christian Paul Sales: study selection; data extraction; and writing of final report

Henriette E Callesen: study selection, data extraction; assessment of risk of bias and GRADE; data analysis; and writing of final report

Klaus Lieb: protocol development; data extraction; and writing of final report

Erik Simonsen: protocol development; data extraction; and writing of final report

All authors contributed to writing the review. Ole Jakob Storebø is the guarantor for the review.

DECLARATIONS OF INTEREST

Jutta M Stoffers-Winterling is a board-certified psychologist, who has worked on a dialectical behaviour therapy (DBT) ward, and attended courses on DBT and schema-focused therapy (SFT).

Ole Jakob Storebø (OJS) is an Editor with Cochrane Developmental, Psychosocial and Learning Problems (CDPLP). He is involved in a trial investigating group mentalisation-based treatment (MBT) for adolescents with borderline personality disorder (BPD). This trial is included in the review as an ongoing study. OJS was not involved in the evaluation of this trial. The assessment of eligibility of the trial was done by Erlend Faltinsen and Adnan Todorovac.

Jessica T Mattivi's institution received a grant from the German Federal Ministry of Education and Research for a systematic review on psychosocial interventions for self-harm in adolescents and a systematic review on pharmacological and non-pharmacological interventions for post-operative delirium in older patients.

Birgit A Völlm – none known.

Mickey Kongerslev is a certified specialist in psychotherapy from the Danish Psychological Association. He has received training in group analysis, cognitive behavioural therapy, and MBT. He received money, from private and public agencies, for teaching MBT for BPD, including supervising psychologists under training to becoming licenced 'special psykolog' certified by the Danish National Health Authorities, and has published scientific articles together with the developers of this treatment. He also receives money for teaching and supervision in assessment and management of personality disorder.

Mie Poulsgaard Jørgensen (MPJ) is a trained DBT therapist and currently conducting a trial on group MBT for adolescents with BPD. This trial is included in the review as an ongoing study. MPJ was not involved in the evaluation of this trial. The assessment of eligibility of the trial was done by Erlend Faltinsen and Adnan Todorovac.

Henriette Edemann Callesen - none known.

Adnan Todorovac - none known.

Christian Sales - none known.

Erlend Faltinsen – none known.

Klaus Lieb (KL) is an Editor with CDPLP. He is a board-certified cognitive behaviour therapist with a special interest in schema therapy. KL has been involved in trials investigating inpatient DBT (Bohus 2004); and inpatient SFT (Reiss 2014). He was not involved in the evaluation of these trials (Bohus 2004: Jutta M Stoffers-Winterling and Birgit A Völlm did eligibility assessments for the previous version of this review; Reiss 2014: Signe Sofie Nielsen and Mickey Kongerslev did the eligibility assessment for this study for the current review).

Erik Simonsen is a board-certified therapist in group analysis.

SOURCES OF SUPPORT

Internal sources

- Psychiatric Research Unit, Region Zealand Psychiatry, Roskilde, Denmark

  Ole Jakob Storebø, Mickey Kongerslev, Mie Poulsgaard Jørgensen, Henriette Edeman Callesen, Adnan Todorovac, Erlend Faltinsen, and Erik Simonsen worked on the review during office hours.
- University Medical Center Mainz, Department of Psychiatry and Psychotherapy, Germany

  Jutta Stoffers-Winterling, Jessica Mattivi and Klaus Lieb worked on the review during office hours.

External sources

- None, Other

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

Authorship

The previous version of this review had the following authors.

1. Jutta M Stoffers
2. Birgit A Völlm
3. Gerta Rücker

4. Antje Timmer
5. Nick Huband
6. Klaus Lieb

Gerta Rücker and Antje Timmer were not involved in either preparing the protocol or the updated current version of the review.

The protocol of the current version of the review had the following authors.

1. Ole Jakob Storebø
2. Jutta M Stoffers-Winterling
3. Birgit A Völlm
4. Mickey T Kongerslev
5. Jessica T Mattivi
6. Maja Lærke Kielsholm
7. Signe Sofie Nielsen
8. Mie Sedoc Jørgensen
9. Erlend Faltinsen
10. Klaus Lieb
11. Erik Simonsen

These following authors worked on the final review but not on the protocol stage and received authorship.

1. Adnan Todorovac
2. Christian Paul Sales
3. Henriette E. Callesen

The following authors did not contribute sufficiently to the final review after the protocol stage and did not receive authorship on the current version of the review.

1. Maja Lærke Kielsholm
2. Signe Sofie Nielsen

Methods

We were not able to use all of our methods as planned (Storebø 2018). We report the unused methods in Table 1.

Search methods for identification of studies: searching other resources

Whilst not specified in the protocol (Storebø 2018), we intend to handsearch the following journals in future updates of this review, in addition to those already listed under Searching other resources:

1. Borderline Personality Disorder and Emotion Dysregulation; and
2. Personality and Mental Health.

Furthermore, we will handsearch any other journal wherein a substantial number of primary trials included in this version of the review have been published, and which may not be included in the list of journals to be handsearched.

Data collection and analysis

Selection of studies

The protocol specified that six review authors (OJS, JMSW, BAV, JTM, MTK, SSN) would work in pairs and independently screen titles and abstracts of all records retrieved by the searches. However, the following additional review authors also selected trials: AT; EF; MSJ and HEC.

The following authors, who worked on the protocol for the review, selected some trials but left the author group early in the development of the review as they no longer wished to be authors: SSN and MTK.

The protocol moreover specified that KL and ES would act as arbiters. However, in the review, OJS and JMSW also functioned as arbiters.

Assessment of risk of bias in included studies

We intend to assess the risk of bias due to unequal rates of medication use in the respective treatment groups in future updates of this review.

Measures of treatment effects: continuous data

For outcomes for which we did not compute an MIREDIF, we specified that we would provide an interpretation of the effect size using Cohen's D (Cohen 1988), considering 0.2 as a small effect, 0.5 as a medium effect size, and 0.8 as a large effect size, in order to help the reader to understand the results.

Unit of analysis issues: adjustment for multiplicity

We planned to adjust the P values and CIs for multiplicity due to the many secondary outcome comparisons following the method described by Jakobsen 2014. However, we only adjusted the primary outcomes and one secondary outcome for multiplicity. We did this because we only wanted to adjust the outcomes presented in the 'Summary of findings' table and felt that adjusting all secondary outcomes was not necessary.

Subgroup analysis and investigation of heterogeneity

Due to a lack of study samples with mean ages above 50 years, we only performed subgroup analyses for the age groups of 15 to under 18 years of age and above 18 years of age.

Moreover, we added the following four, post hoc subgroup analyses.

1. Types of raters
2. Types of TAU
3. Trials comparing psychotherapy with TAU compared with trials comparing psychotherapy with waiting list or no treatment
4. Types of scales

TSA

When performing the TSA analyses, we did not use a standard deviation (SD) for the primary outcome of 1.0, and we did not always use an anticipated intervention effect of Hedge´s g of 0.5 (½ SD) as described in the protocol (Storebø 2018). Instead, we used the SD from the trial as a basis for the transformation of SMD values to MD values. Also, we preferred to use the MIREDIF reported in articles, and only if we could not find it did we use the ½ SD.

Sensitivity analysis

We added one analysis post hoc: imprecision as assessed by GRADE, by conducting TSA analyses on all primary outcomes and the three secondary outcomes (for the main comparison versus TAU) not closely connected to the BPD core symptoms (depression, attrition and adverse effects) with significant findings.

NOTES

This is a new review, which replaces the following, published review: Stoffers JM, Völlm BA, Rücker G, Timmer A, Huband N, Lieb K. Psychological therapies for people with borderline personality disorder. Cochrane Database of Systematic Reviews 2012, Issue 8. Art. No.: CD005652. DOI: 10.1002/14651858.CD005652.pub2.

INDEX TERMS

Medical Subject Headings (MeSH)

Borderline Personality Disorder [*therapy]; Depression [therapy]; Dialectical Behavior Therapy [statistics & numerical data]; Mentalization; Patient Dropouts [statistics & numerical data]; Psychotherapy [*methods] [statistics & numerical data]; Randomized Controlled Trials as Topic; Self-Injurious Behavior [therapy]; Suicide Prevention; Treatment Outcome; Waiting Lists

MeSH check words

Adolescent; Adult; Female; Humans; Male; Middle Aged; Young Adult