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Treating PTSD in Suicidal and Self-injuring Women with Borderline Personality Disorder: Development and Preliminary Evaluation of a Dialectical Behavior Therapy Prolonged Exposure Protocol

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Abstract

This study focused on the development and pilot testing of a protocol based on Prolonged Exposure (PE) that can be added to Dialectical Behavior Therapy (DBT) to treat PTSD in suicidal and self-injuring individuals with borderline personality disorder (BPD). Women with BPD, PTSD, and recent and/or imminent serious intentional self-injury (n=13) received one year of DBT with the DBT PE Protocol, plus three months of follow up assessment. The treatment was associated with significant reductions in PTSD, with the majority of patients no longer meeting criteria for PTSD at post-treatment (71.4% of DBT PE Protocol completers, 60.0% of the intent-to-treat sample). A minority of patients (27.3%) engaged in intentional self-injury during the study. Improvements were also found for suicidal ideation, dissociation, trauma-related guilt cognitions, shame, anxiety, depression, and social adjustment. There was no evidence that the DBT PE Protocol led to exacerbations of intentional self-injury urges or behaviors, PTSD, treatment dropout, or crisis service use. Overall, the results indicate that this integrated BPD and PTSD treatment is feasible to implement within one year of treatment, highly acceptable to patients and therapists, safe to administer, and shows promise as an effective intervention for PTSD in this complex and high-risk patient population.

Keywords

Borderline personality disorder; posttraumatic stress disorder; suicide; self-injury

The high comorbidity between borderline personality disorder (BPD) and posttraumatic stress disorder (PTSD) is well-documented, with approximately 30–50% of individuals with BPD also meeting criteria for PTSD (Harned, Rizvi, & Linehan, 2010b; Pagura et al., 2010). Individuals with BPD and PTSD are more impaired in terms of global psychological

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distress, Axis I comorbidity, emotion dysregulation, and suicidal and non-suicidal self-injury (NSSI) than those with BPD alone (Harned et al., 2010; Pagura et al., 2010). Overall, the presence of PTSD predicts a lower likelihood of remitting from BPD across ten years of naturalistic follow-up (Zanarini, Frankenburg, Hennen, Reich, & Silk, 2006).

Despite the frequent co-occurrence of BPD and PTSD, few approaches exist for treating PTSD among BPD patients, particularly those with recent intentional self-injury (i.e., suicide attempts and/or NSSI). PTSD treatment guidelines uniformly recommend addressing imminent suicidality before treating PTSD (e.g, Foa, Keane, Friedman, & Cohen, 2009) and acutely suicidal patients are routinely excluded from PTSD treatment studies (Bradley, Greene, Russ, Dutra, & Westen, 2005). Of the PTSD treatment studies that have reported including BPD patients, all excluded recently and/or imminently suicidal patients and the majority excluded patients with a variety of other problems that frequently co-occur with severe BPD (e.g., NSSI, substance dependence; Clarke, Rizvi, & Resick, 2008; Feeny, Zoellner, & Foa, 2002; Cloitre et al., 2010; Steil, Dyer, Priebe, Kleindienst, & Bohus, 2011; Mueser et al., 2008; McDonagh et al., 2005). Thus, no treatments exist that target PTSD among suicidal and self-injuring patients in general, or those with BPD in particular.

In contrast, BPD treatments include suicidal and self-injuring patients but often do not target their PTSD. Dialectical Behavior Therapy (DBT; Linehan, 1993), the most empirically supported treatment available for BPD, recommends the use of exposure to treat PTSD, but does not include a protocol specifying when or how to do this. Thus, although DBT is effective in reducing intentional self-injury among BPD patients with PTSD (Harned, Jackson, Comtois, & Linehan, 2010a), studies to date have not targeted PTSD specifically. As a result, the rate of PTSD remission in DBT is relatively low (35%; Harned et al., 2008). Studies of other BPD treatments have not included PTSD as an outcome (Bateman & Fonagy, 1999; Blum et al., 2008; Clarkin, Levy, Lenzenweger, & Kernberg, 2007; Giesen-Bloo et al., 2006).

The present study focused on developing a protocol based on Prolonged Exposure (PE; Foa, Hembree, & Rothbaum, 2007) that can be added to DBT to treat PTSD among suicidal and self-injuring BPD patients. PE was selected because exposure therapies are the most empirically supported treatments available for PTSD (Institute of Medicine, 2007), and PE is the most researched exposure treatment (Powers, Halpern, Ferenschak, Gillihan, & Foa, 2010). The combined DBT and DBT PE Protocol treatment differs from existing approaches by: (1) providing integrated, concurrent treatment for BPD and PTSD, (2) including suicidal and self-injuring patients, (3) implementing standard DBT (instead of modified DBT) in combination with exposure therapy for PTSD (PE), and (4) incorporating strategies and procedures designed to address the specific needs and complexities of this patient population. Initial case studies of this treatment have been published previously (Harned & Linehan, 2008) and the present study focused on the continued development and pilot testing of the treatment using an open trial design. Specifically, the current study evaluated whether DBT with the DBT PE Protocol was: (1) associated with improvements in PTSD and intentional self-injury as well as secondary outcomes, (2) feasible to implement, (3) acceptable to patients and therapists, and (4) safe to administer.

Methods

Participants

Participants were 13 women (aged 18–60) with BPD, PTSD, and recent and/or imminent suicidal behavior or serious NSSI, defined as: (a) recent (past 3 months) suicide attempt or serious NSSI, and/or (b) imminent threat of suicidal behavior (i.e., current moderate to severe suicidal ideation with a suicide plan and intent to commit suicide within the next 4

weeks). Participants were excluded if they met criteria for a psychotic disorder, mental retardation, or bipolar disorder, or were mandated to treatment. All data were collected in accord with IRB approved procedures.

Recruitment and Assessments

Participants were recruited via outreach to area treatment providers and advertisements. Enrollment and follow-up ran from August 2009 through April 2011. After an initial phone screen, participants completed an in-person assessment to evaluate study inclusion/exclusion criteria. Outcome assessments occurred at 6 months (mid-treatment), 12 months (post-treatment), and 15 months (3-month follow-up). All assessments were conducted by independent clinical assessors who had been trained to reliability by the instrument developer or an approved trainer. A total of 49 individuals completed the initial phone screen, 28 passed the initial phone screen, and 22 completed the in-person screening assessment. Fourteen participants were accepted into the study and, of these, 13 attended at least one therapy session (i.e., the intent-to-treat (ITT) sample).

Therapists

Therapists (n=6) were primarily female (83.3%), doctoral (50%) or masters-level (50%) clinicians, and had an average of 6.5 years of post-degree clinical experience (SD = 4.2). Individual therapists treated an average of 4.3 patients (SD = 0.6). All but one therapist had attended a DBT Intensive Training and all individual therapists attended a PE Intensive Training and received PE expert consultation on their first two patients.

Treatment

All patients received one year of standard DBT, including (1) individual therapy (1 hr/wk), (2) group skills training (2.5 hr/wk), (3) phone consultation (as needed), and (4) therapist consultation team meeting (1 hr/wk). The DBT PE Protocol was implemented during the one year of DBT once patients achieved sufficient control over higher-priority targets. Specifically, the following criteria were used to determine readiness to begin the DBT PE Protocol: (1) not at imminent risk of suicide, (2) no recent (past 2 months) suicide attempts or NSSI1, (3) ability to control life-threatening behaviors when in the presence of cues for those behaviors, (4) no serious therapy-interfering behaviors, (5) PTSD is the highest priority target for the patient, and (6) ability and willingness to experience intense emotions without escaping. The DBT PE Protocol was implemented concurrently with standard DBT such that patients received either one combined individual therapy session per week (90 minutes of the DBT PE Protocol and 30 minutes of DBT) or two individual therapy sessions per week (one DBT PE Protocol session (90 minutes) and one DBT session (1 hour)) as well as group DBT skills training and as needed phone consultation. The duration of the DBT PE Protocol was based on continuous assessment of the patient's PTSD symptoms and treatment goals.

The DBT PE Protocol is based on PE (Foa et al., 2007) and utilizes in vivo and imaginal exposure as the primary treatment components. DBT strategies and procedures were incorporated into PE to: (1) increase monitoring of potential negative reactions to exposure (e.g., pre-post exposure ratings of urges to commit suicide), (2) target problems that may occur during or as a result of exposure (e.g., via DBT skills and protocols), and (3) utilize DBT therapist strategies (e.g., dialectics, irreverence, validation) that address the particular needs of severe BPD patients. The protocol also includes procedures for addressing higher-

[1]For the purpose of treatment development, one patient was allowed to start the DBT PE Protocol who was still actively engaging in low-risk NSSI.

priority behaviors that may occur during the treatment, including a requirement that the protocol be stopped (ideally temporarily) if any form of intentional self-injury recurs. See Harned (in press) for a detailed description of the DBT PE Protocol.

Measures

Sample characteristics—The International Personality Disorder Examination (Loranger, 1995) was used to diagnose Axis II disorders and the Structured Clinical Interview for DSM-IV, Axis I (First, Spitzer, Gibbon, & Williams, 1995) was used to diagnose all Axis I disorders except PTSD. The PTSD Symptom Scale – Interview (PSS-I; Foa, Riggs, Dancu, & Rothbaum, 1993) was used to diagnose PTSD in relation to a specific index trauma. The Traumatic Life Events Questionnaire (Kubany et al., 2000) and the Childhood Experiences Questionnaire (Linehan, unpublished) assessed lifetime history of 25 types of traumatic events.

Treatment feasibility—Feasibility of the treatment was assessed via rates of treatment retention and completion of the DBT PE Protocol. Completing DBT was defined as attending one year of treatment without missing four consecutive weeks of either individual therapy or group skills training. Completing the DBT PE Protocol was defined as completing at least 6 sessions of the protocol.

Treatment acceptability—Participants' preferred treatment (DBT alone, PE alone, or a combined DBT and PE treatment) was assessed at intake using an adapted version of Zoellner and colleagues' (2003) treatment choice measure. An adapted version of the Expectancies Questionnaire (Shaw et al., 1999) assessed patient and therapist treatment expectancies (range = 1–7). The Client Satisfaction Questionnaire (Larsen, Attkisson, Hargreaves, & Nguyen, 1979) measured patients' satisfaction with the treatment at post-treatment (range = 1–4).

Treatment safety—Urges to commit suicide and self-injure (range = 0–5) were assessed immediately before and after each individual therapy session, as well as before and after each imaginal and in vivo exposure task (both in-session and homework tasks). The occurrence of suicide attempts, NSSI, and crisis service use (i.e., inpatient hospitalizations, emergency room visits for psychological reasons) during the DBT PE Protocol was measured via the Suicide Attempt Self-Injury Interview (SASII; Linehan, Comtois, Brown, Heard, & Wagner, 2006a) and the Treatment History Interview (Linehan & Heard, unpublished).

Primary clinical outcomes

PTSD: The PSS-I (Foa et al., 1993) assessed the presence and severity of PTSD during the past two weeks at each outcome assessment. Reliable change in PTSD symptoms was defined as a change larger than the standard error of the difference between two measurements, given by the formula $SED = \sqrt{[2(SEM^2)]}$, where $SEM = SD*\sqrt{(1-r)}$. This value was calculated as a change greater ± 7.53 points using data from a large sample (N = 196) of female assault survivors (Foa, unpublished data).

Intentional self-injury: The SASII (Linehan et al., 2006a) assessed the frequency of suicide attempts and NSSI and the Suicidal Behaviors Questionnaire (Linehan, unpublished work) assessed the frequency of self-reported suicidal ideation at each outcome assessment.

Secondary clinical outcomes—Three self-report measures assessed pathological dissociation (Dissociative Experiences Scale – Taxon; Waller & Ross, 1997), trauma-related guilt cognitions (Trauma Related Guilt Inventory; Kubany et al., 1996), and shame

(Experience of Shame Scale; Andrews, Qian, & Valentine, 2002). Interviewer-rated depression and general anxiety were assessed via the Hamilton Rating Scale for Depression (Hamilton, 1960) and Hamilton Rating Scale for Anxiety (Hamilton, 1959). Social functioning was measured via an interviewer-rated Global Social Adjustment (GSA) score for the worst week in the past month. All outcomes were measured at baseline and each outcome assessment with the exception of GSA (pre-post only).

Statistical Methods

All outcome analyses were conducted for both the ITT and DBT PE Protocol completer samples. Mixed-effects models (hierarchichal linear models and mixed model analyses of variance) were used to analyze within-group change as a function of time for measures that were assessed at multiple outcome points. Paired-sample t-tests were used for outcomes that were only assessed at pre- and post-treatment. Effect sizes were calculated using Cohen's *d* statistic following a formula that corrects for the correlation between means in a single-group repeated measures design: $d = M_{post} - M_{pre} / SD_{change\ scores}$, where $SD_{change\ scores} = \sqrt{SD^2_{pre} + SD^2_{post} - [(2)(r)(SD_{pre})(SD_{post})]}$. The sample size of 13 had power of 75.4% to detect a large effect (i.e., $d = 0.8$) with $\alpha = .05$ and assuming the within-subject correlation was $\rho = 0.5$.

Results

Sample Characteristics

Participants were an average age of 39.4 years (*SD* = 11.4), primarily White (69.2%), non-married (61.5%), not college graduates (69.2%), and low income (< $20,000 per year; 90.9%). Participants reported an average of 14.0 types of lifetime trauma (*SD* = 5.5) beginning before age 6 (*M* age of onset= 5.2, *SD* = 3.0). Index traumas included: childhood sexual abuse (61.5%), adult rape (15.4%), childhood physical abuse (7.7%), witnessing family violence (7.7%), and suicide of a parent (7.7%). In the past year, 23.1% had attempted suicide (*M* attempts = 0.3, *SD* = 0.6) and 92.3% had engaged in NSSI (*M* acts = 38.3, *SD* = 69.3). Participants met criteria for an average of 4.6 current Axis I disorders (*SD* = 1.4) and 2.2 Axis II disorders (*SD* = 1.1).

Treatment Feasibility

Treatment retention—Ten patients (76.9%) completed one year of DBT and 3 (23.1%) dropped out of treatment prematurely. All three patients who dropped out of treatment did so before beginning the DBT PE Protocol and reasons for premature dropout were: moved out of state (*n*=1), concerns about the pharmacotherapy protocol (*n*=1), and unknown (*n*=1).

DBT PE Protocol implementation—Of the 10 patients who completed one year of DBT, 100% started the DBT PE Protocol and this occurred at week 18.5 of DBT on average (range = 7–30, *SD* = 7.7). The majority of these patients (*n*=7, 70%) completed the DBT PE Protocol in an average of 13.0 sessions (range = 6–19, *SD* = 4.5) during which an average of 2.4 trauma memories were targeted (range = 1–5, *SD* = 1.6). Three patients (30%) started but did not complete the DBT PE Protocol (*M* sessions = 2.7, *SD* = 0.6, range = 2–3). Reasons for non-completion were: unwilling to experience intense emotions elicited by exposure (*n*=1), failure to sufficiently control NSSI (*n*=1), and increased auditory hallucinations (*n*=1).

Treatment Acceptability

At intake, the majority of patients indicated a preference for a combined DBT and PE treatment (*n*=10, 76.9%) and the remainder preferred to receive DBT only (*n*=3, 23.1%).

Patients reported very positive treatment expectancies at all time points (*M*s = 5.5 – 6.4, SDs = 0.4 – 1.0) and were highly satisfied with the treatment they received at post-treatment (*M* = 3.6, SD = 0.3). Therapist treatment expectancies were also very positive (*Ms* = 5.5 – 6.1, *SDs* = 1.3 – 1.4).

Treatment Safety

As shown in Table 1, the average intensity of pre- and post-session urges to commit suicide and self-injure did not differ between DBT and DBT PE Protocol sessions. There was a significant difference in the pattern of change in urges to commit suicide by session type; namely, suicide urges were more likely to decrease after a DBT PE Protocol session than a DBT session (46.9% vs. 25.8%; χ^2 (1) = 8.4, $p < .01$). The pattern of change in urges to self-injure did not significantly differ between the two types of sessions. Overall, the likelihood of suicide and self-injury urges increasing after individual therapy sessions was low (<20% of sessions) and comparable for DBT and DBT PE Protocol sessions. Similarly, urges to commit suicide and self-injure rarely increased as an immediate result of completing an exposure task (<7% of tasks).

Of the 10 patients who started the DBT PE Protocol, 2 (20%) engaged in intentional self-injury during this portion of the treatment (suicide attempt and NSSI (n=1), NSSI only (n=1)2). The patient who attempted suicide also had two episodes of crisis service use during the DBT PE Protocol, which was not an increase from baseline. No other patients utilized crisis services at any time during the treatment year.

Clinical Outcomes

Descriptive data and within-group effect sizes are presented in Table 2 and results of the mixed effects models are shown in Table 3.

Primary outcomes

PTSD: There was a large and significant reduction in PTSD severity in the ITT sample and among DBT PE Protocol completers. At post-treatment, the majority of patients had experienced a reliable improvement in PTSD (85.7% of the DBT PE Protocol completers, 70.0% of the ITT sample) and the remainder had no reliable change (14.3% of DBT PE Protocol completers, 30.0% of the ITT sample). Rates of PTSD remission were also high at post-treatment (71.4% of the DBT PE Protocol completers, 60.0% of the ITT sample). Improvements in PTSD severity were maintained in the three months after treatment ended. At 3-month follow-up, PTSD severity remained significantly reduced compared to pre-treatment and rates of reliable improvement (85.7% of DBT PE Protocol completers, 81.8% of the ITT sample) and remission (57.1% of DBT PE Protocol completers, 45.5% of the ITT sample) remained high.

Intentional self-injury: Three patients (27.3%) engaged in intentional self-injury during the study (suicide attempt: *n*=1, 9.1%, NSSI: *n*=3, 27.3%). Given the low frequency of intentional self-injury, mixed effects models could not be estimated. Effect sizes for changes in the frequency of intentional self-injury acts were moderate in the ITT sample and large among DBT PE Protocol completers. There was also a significant and large reduction in suicidal ideation in both samples.

[2]The patient who engaged in NSSI only was the patient who was allowed to start the DBT PE Protocol while still engaging in low-risk NSSI. Thus, the NSSI that occurred during the DBT PE Protocol does not constitute a relapse as the behavior had never stopped.

Secondary outcomes—Moderate to large pre-post effect sizes were found for all secondary outcomes (i.e., dissociation, trauma-related guilt cognitions, shame, anxiety, depression, global social adjustment) among DBT PE Protocol completers, and for all secondary outcomes except depression in the ITT sample. Mixed effects models found significant reductions across time for the majority of secondary outcomes in both samples and all treatment gains were maintained in the 3 months after treatment ended. Finally, global social adjustment improved significantly from pre- to post-treatment in both samples (p's < .01).

Discussion

The combined DBT and DBT PE Protocol treatment was acceptable and feasible to implement for the majority of patients. Both patients and therapists reported positive treatment expectancies and patients were highly satisfied with the treatment they received. The rate of treatment dropout was low (23.1%) and comparable to the rate found in a meta-analysis of DBT studies (27.3%; Kliem, Kroger, & Kosfelder, 2010). Of the patients who completed DBT, 100% achieved the stability necessary to begin the DBT PE Protocol and 70% completed it within the year of treatment. The average duration of the DBT PE Protocol (13 sessions) is consistent with PE and the rate of non-completion (30%) is similar to the dropout rate found in PE studies (34%; Foa et al., 2005). These findings suggest that, when administered concurrently with DBT, severe BPD patients do not require significantly lengthier PTSD treatment, nor are they more likely to fail to complete PE than other types of PTSD patients.

The DBT PE Protocol was also safe to implement in this high-risk population. Urges to commit suicide and self-injure rarely increased immediately after completing an exposure task (<7% of tasks) and the intensity of pre- and post-session urges to commit suicide and self-injure did not differ between DBT and DBT PE Protocol sessions. The rates of intentional self-injury relapse and crisis service use during the DBT PE Protocol were both low (10%). More generally, few patients attempted suicide (9.1%) or engaged in NSSI (27.3%) during the study and these rates are lower than those typically found in DBT studies (e.g., Linehan et al., 2006b; McMain et al., 2009). Clinical observations suggest that the low incidence of intentional self-injury was primarily due to making the delivery of the DBT PE Protocol explicitly contingent on achieving control over these behaviors. Specifically, the promise of receiving an effective treatment for a problem viewed by the patient as high-priority appeared to function as a powerful reinforcer to quickly gain control over intentional self-injury. Thus, rather than exacerbating intentional self-injury urges and behaviors, the addition of the DBT PE Protocol to DBT may actually decrease the frequency of these behaviors, particularly among patients who are motivated to receive PTSD treatment.

The treatment was also associated with significant and stable reductions in PTSD. At post-treatment and 3-month follow-up, effect sizes were large (d's = 1.4–2.3), most patients (70–86%) experienced a reliable improvement in PTSD, and no patients exhibited a reliable worsening. The majority of patients also achieved remission from PTSD at post-treatment (DBT PE Protocol completers = 71.4%, ITT = 60.0%). These results are comparable to those found in a meta-analysis of exposure treatments for PTSD (d = 1.6, PTSD remission= 53–68%; Bradley et al., 2005), suggesting that the DBT PE Protocol is as effective as other exposure-based PTSD treatments.

The treatment was also associated with significant improvements in a variety of secondary outcomes, including dissociation, trauma-related guilt, shame, anxiety, depression, and global social adjustment. Thus, the combined DBT and DBT PE Protocol treatment appears

to be well-equipped to address a wide range of problems that commonly co-occur with BPD and PTSD.

The primary limitations of the present study are the open trial design and the small sample size. Future randomized controlled trials using larger samples are needed to replicate these findings,

In summary, the present study provides preliminary data supporting the feasibility, acceptability, safety, and potential effectiveness of combining standard DBT with the DBT PE Protocol. This is the first treatment developed specifically for suicidal and self-injuring PTSD patients in general, and those with co-occurring BPD in particular. These patients are often viewed by clinicians as inappropriate for PTSD treatment and many have spent decades receiving mental health services that have not addressed their PTSD. This is concerning not only because of the suffering associated with chronic PTSD, but also because PTSD often maintains or exacerbates suicidality, self-injury, and other BPD-related problems. The present study provides hope for both patients and clinicians that PTSD can be effectively and safely treated in this complex patient population.

Highlights

- Developed a DBT PE Protocol to treat PTSD in suicidal/self-injuring BPD patients.
- DBT with the DBT PE Protocol was examined in an open trial.
- The treatment was feasible to administer and acceptable to patients and therapists.
- Improvements were found in intentional self-injury, PTSD, and secondary outcomes.
- There was no evidence of any adverse reactions to the treatment.

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References

Andrews B, Qian MY, Valentine JD. Predicting depressive symptoms with a new measure of shame: The Experience of Shame Scale. British Journal of Clinical Psychology. 2002; 41:29–42. [PubMed: 11931676]

Bateman A, Fonagy P. Effectiveness of Partial Hospitalization in the Treatment of Borderline Personality Disorder: A Randomized Controlled Trial. American Journal of Psychiatry. 1999; 156:1563–1569. [PubMed: 10518167]

Blum N, St JD, Pfohl B, Stuart S, McCormick B, Allen J, et al. Systems Training for Emotional Predictability and Problem Solving (STEPPS) for outpatients with borderline personality disorder: A randomized controlled trial and 1-year follow-up. Am.J.Psychiatry. 2008; 165:468–478. [PubMed: 18281407]

Bradley R, Greene J, Russ E, Dutra L, Westen D. A multidimensional meta-analysis of psychotherapy for PTSD. Am.J.Psychiatry. 2005; 162:214–227. [PubMed: 15677582]

Clarke SB, Rizvi S, Resick PA. Borderline personality characteristics and treatment outcome in cognitive-behavioral treatments for PTSD in female rape victims. Behavior Therapy. 2008; 39:72–78. [PubMed: 18328872]

Clarkin JF, Levy KN, Lenzenweger MF, Kernberg OF. Evaluating three treatments for borderline personality disorder: a multiwave study. American Journal of Psychiatry. 2007; 164:922–928. [PubMed: 17541052]

Cloitre M, Stovall-McClough KC, Nooner K, Zorbas P, Cherry S, Jackson CL, et al. Treatment for PTSD Related to Childhood Abuse: A Randomized Controlled Trial. American Journal of Psychiatry. 2010; 167:915–924. [PubMed: 20595411]

Feeny NC, Zoellner LA, Foa EB. Treatment outcome for chronic PTSD among female assault victims with borderline personality characteristics: a preliminary examination. Journal of Personality Disorders. 2002; 16:30–40. [PubMed: 11881159]

First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JBW. Structured Clinical Interview for Axis I DSM-IV Disorders - Patient Edition (SCID-I/P). New York: Biometrics Research Deparment, NY State Psychiatric Institute; 1995.

Foa EB, Hembree EA, Cahill SP, Rauch SA, Riggs DS, Feeny NC, et al. Randomized trial of prolonged exposure for posttraumatic stress disorder with and without cognitive restructuring: outcome at academic and community clinics. Journal of Consulting and Clinical Psychology. 2005; 73:953–964. [PubMed: 16287395]

Foa, E.; Hembree, E.; Rothbaum, B. Prolonged Exposure Therapy for PTSD: Emotional processing of traumatic experiences. New York: Oxford University Press; 2007.

Foa, EB.; Keane, TM.; Friedman, MJ.; Cohen, JA. Effective treatments for PTSD: Practice guidelines from the International Society for Traumatic Stress Studies. 2nd ed.. New York, NY: Guilford Press; 2009.

Foa EB, Riggs DS, Dancu CV, Rothbaum BO. Reliability and validity of a brief instrument for assessing post-traumatic stress disorder. Journal of Traumatic Stress. 1993; 6:459–473.

Giesen-Bloo J, Van Dyck R, Spinhoven P, van Tilburg W, Dirksen C, van Asselt T, et al. Outpatient psychotherapy for borderline personality disorder: randomized trial of schema-focused therapy vs transference-focused psychotherapy. Archives of General Psychiatry. 2006; 63:649–658. [PubMed: 16754838]

Hamilton M. The assessment of anxiety states by rating. British Journal of Medical Psychology. 1959; 32:50–55. [PubMed: 13638508]

Hamilton M. A rating scale for depression. Journal of Neurology, Neurosurgery and Psychiatry. 1960; 23:56–62.

Harned MS, Chapman AL, Dexter-Mazza ET, Murray A, Comtois KA, Linehan MM. Treating co-occurring Axis I disorders in recurrently suicidal women with borderline personality disorder: A 2-year randomized trial of dialectical behavior therapy versus community treatment by experts. Journal of Consulting and Clinical Psychology. 2008; 76:1068–1075. [PubMed: 19045974]

Harned MS, Jackson SC, Comtois KA, Linehan MM. Dialectical Behavior Therapy as a precursor to PTSD treatment for suicidal and/or self-injuring women with borderline personality disorder. Journal of Traumatic Stress. 2010a; 23:421–429. [PubMed: 20648564]

Harned MS, Rizvi SL, Linehan MM. The impact of co-occurring posttraumatic stress disorder on suicidal women with borderline personality disorder. American Journal of Psychiatry. 2010b; 167:1210–1217. [PubMed: 20810470]

Harned M, Linehan M. Integrating Dialectical Behavior Therapy and Prolonged Exposure to treat co-occurring borderline personality disorder and PTSD: Two case studies. Cognitive and Behavioral Practice. 2008; 15:263–276.

Institute of Medicine. Treatment of PTSD: An assessment of the evidence. Washington, DC: National Academies Press; 2007.

Kliem S, Kroger C, Kosfelder J. Dialectical Behavior Therapy for borderline personality disorder: A meta-analysis using mixed-effects modeling. Journal of Consulting and Clinical Psychology. 2010; 78:936–951. [PubMed: 21114345]

Kubany ES, Haynes SN, Abueg FR, Manke FP, Brennan JM, Stahura C. Development and validation of the trauma-related guilt inventory (TRGI). Psychological Assessment. 1996; 8:428–444.

Kubany ES, Haynes SN, Leisen MB, Owens JA, Kaplan AS, Watson SB, et al. Development and preliminary validation of a brief broad-spectrum measure of trauma exposure: The Traumatic Life Events Questionnaire. Psychological Assessment. 2000; 12:210–224. [PubMed: 10887767]

Larsen DL, Attkisson CC, Hargreaves WA, Nguyen TD. Assessment of client/patient satisfaction: Development of a general scale. Evaluation and Program Planning. 1979; 2:197–207. [PubMed: 10245370]

Linehan, M. Cognitive-behavioral treatment of borderline personality disorder. New York: Guilford Press; 1993.

Linehan MM, Comtois KA, Brown MZ, Heard HL, Wagner A. Suicide Attempt Self-Injury Interview (SASII): development, reliability, and validity of a scale to assess suicide attempts and intentional self-injury. Psychological Assessment. 2006a; 18:303–312. [PubMed: 16953733]

Linehan MM, Comtois KA, Murray AM, Brown MZ, Gallop RJ, Heard HL, et al. Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. Archives of General Psychiatry. 2006b; 63:757–766. [PubMed: 16818865]

Loranger, AW. International Personality Disorder Examination (IPDE) Manual. White Plains, NY: Cornell Medical Center; 1995.

McDonagh A, Friedman M, McHugo G, Ford J, Sengupta A, Mueser K, et al. Randomized trial of cognitive-behavioral therapy for chronic posttraumatic stress disorder in adult female survivors of childhood sexual abuse. Journal of Consulting and Clinical Psychology. 2005; 73:515–524. [PubMed: 15982149]

McMain SF, Links PS, Gnam WH, Guimond T, Cardish RJ, Korman L, Streiner DL. A randomized trial of dialectical behavior therapy versus general psychiatric management for borderline personality disorder. American Journal of Psychiatry. 2009; 166:1365–1374. [PubMed: 19755574]

Mueser KT, Rosenberg SD, Xie H, Jankowski MK, Bolton EE, Lu W, et al. A randomized controlled trial of cognitive-behavioral treatment for posttraumatic stress disorder in severe mental illness. Journal of Consulting and Clinical Psychology. 2008; 76:259–271. [PubMed: 18377122]

Pagura J, Stein MB, Bolton JM, Cox BJ, Grant B, Sareen J. Comorbidity of borderline personality disorder and posttraumatic stress disorder in the U.S. population. Journal of Psychiatric Research. 2010; 44:1190–1198. [PubMed: 20537660]

Powers MB, Halpern JM, Ferenschak MP, Gillihan SJ, Foa EB. A meta-analytic review of prolonged exposure for posttraumatic stress disorder. Clinical Psychology Review. 2010; 30:635–641. [PubMed: 20546985]

Shaw BF, Elkin I, Yamaguchi J, Olmsted M, Vallis TM, Dobson KS, et al. Therapist competence ratings in relation to clinical outcome in cognitive therapy of depression. J.Consult Clin.Psychol. 1999; 67:837–846. [PubMed: 10596506]

Steil RS, Dyer A, Priebe K, Kleindienst N, Bohus M. Dialectical Behavior Therapy for posttraumatic stress disorder related to childhood sexual abuse: A pilot study of an intensive residential treatment program. Journal of Traumatic Stress. 2011; 24:102–106. [PubMed: 21351167]

Waller NG, Ross CA. The prevalence and biometric structure of pathological dissociation in the general population: Taxometric and behavior genetic findings. Journal of Abnormal Psychology. 1997; 106:499–510. [PubMed: 9358680]

Zanarini MC, Frankenburg FR, Hennen J, Reich DB, Silk KR. Prediction of the 10-year course of borderline personality disorder. American Journal Psychiatry. 2006; 163:827–832.

Zoellner LA, Feeny NC, Cochran B, Pruitt L. Treatment choice for PTSD. Behaviour Research and Therapy. 2003; 41:879–886. [PubMed: 12880643]

Table 1

Urges to Commit Suicide, Self-Injure, and Use Substances Before and After Individual Therapy Sessions and Exposure Tasks

	DBT sessions (*n*=209)	DBT PE Protocol sessions (*n*=49)	Statistic	*p*	Exposure Tasks (*n*=516)
Urges to Commit Suicide					
Intensity of Urges, M ± SD					
Before	0.9 ± 1.3	1.3 ± 1.3	$t(289) = 1.9$	.06	0.5 ± 1.1
After	0.6 ± 1.0	0.9 ± 1.3	$t(256) = 1.4$	.17	0.5 ± 1.1
Change in Urges, n (%)					
Decrease in urges	54 (25.8%)	23 (46.9%)	χ^2 (2) =12.9	.002	64 (12.4%)
No change in urges	139 (66.5%)	19 (38.8%)			418 (81.0%)
Increase in urges	16 (7.7%)	7 (14.3%)			34 (6.6%)
Urges to Self-Injure					
Intensity of Urges, M ± SD					
Before	1.2 ± 1.5	1.6 ± 1.6	$t(289) = 1.9$	.06	0.6 ± 1.2
After	0.9 ± 1.3	1.2 ± 1.6	$t(256) = 1.3$	.19	0.5 ± 1.2
Change in Urges, n (%)					
Decrease in urges	49 (23.4%)	16 (32.7%)	χ^2 (2) = 5.6	.06	64 (12.4%)
No change in urges	139 (66.5%)	24 (49.0%)			421 (81.4%)
Increase in urges	21 (10.0%)	9 (18.4%)			32 (6.2%)

Note. Urges were rated on a 0 to 5 scale. Measures to assess pre-post session urges were added to the assessment battery after the study started and data are therefore available for only a subset of the therapy sessions (DBT sessions: n = 209/404, PTSD Protocol sessions: n = 49/99). Pre-post exposure urges were assessed throughout the study.

Table 2

Means, Standard Deviations, and Within-Group Effect Sizes for each Outcome Measure by Timepoint and Treatment Completer Status

	Intent-to-Treat (n=13)						DBT PE Protocol Completers (n=7)					
	Baseline (*n*=13)	6-month (*n*=11)	12-month (*n*=11)	15-month (*n*=11)	Effect sizes (*d*)		Baseline (*n*=7)	6-month (*n*=7)	12-month (*n*=7)	15-month (*n*=7)	Effect sizes (*d*)	
Outcome	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**Pre-Post**	**Pre-FU**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**Pre-Post**	**Pre-FU**
PTSD	35.5 (10.1)	21.8 (13.9)	15.2 (11.7)	17.1 (8.7)	1.4*	2.3*	36.6 (8.6)	24.4 (14.0)	13.9 (13.3)	17.9 (9.1)	1.7*	2.2*
Intentional self-injury acts	38.6 (69.1)	2.2 (6.6)	1.5 (3.2)	0.4 (0.9)	0.5[a]	0.6[a]	12.1 (12.9)	0.3 (0.8)	1.0 (2.6)	0.4 (1.1)	0.9[a]	0.9[a]
Suicidal ideation	10.8 (5.0)	6.8 (5.3)	6.5 (4.5)	5.3 (4.3)	0.8*	1.0*	10.7 (5.6)	7.1 (6.4)	5.4 (4.9)	5.0 (4.9)	1.0*	0.9*
Dissociation	28.1 (15.3)	23.8 (15.1)	13.8 (12.8)	18.1 (17.9)	1.0*	1.4*	28.5 (15.0)	23.6 (15.7)	13.9 (16.0)	20.9 (20.7)	1.2*	1.1*
Trauma-related guilt cognitions	2.3 (0.8)	1.9 (0.9)	1.5 (0.8)	1.7 (1.0)	1.0*	0.6*	2.0 (0.8)	1.8 (0.9)	1.4 (0.9)	1.5 (1.1)	0.7	0.4
Shame	85.8 (10.2)	79.0 (15.7)	68.5 (23.6)	72.7 (18.9)	0.9*	0.8*	87.4 (13.1)	76.3 (18.3)	61.3 (27.0)	68.1 (22.1)	1.3*	1.1*
Anxiety	24.3 (8.0)	19.1 (8.4)	15.8 (7.6)	19.8 (8.4)	0.8*	0.4	25.6 (6.2)	19.1 (8.8)	15.1 (8.2)	20.6 (9.4)	1.6*	0.8
Depression	19.7 (6.4)	16.3 (8.6)	15.5 (6.5)	20.2 (6.4)	0.5	−0.1	20.1 (4.6)	17.4 (8.5)	14.1 (5.6)	19.9 (6.5)	0.9*	0.1
Global social adjustment	4.4 (0.5)	–	3.6 (0.5)	–	1.2*	–	4.3 (0.5)	–	3.6 (0.5)	–	1.5*	–

Note. Means, standard deviations and effect sizes were calculated using the raw data. Effect sizes with an asterisk represent statistically significant changes from pre-treatment. FU = 3-month follow-up.

[a]Mixed effects models to determine statistical significance could not be computed for intentional self-injury acts due to the low frequency of these behaviors.

Table 3

Results of Mixed Effects Models

	Intent-to-Treat (*n*=13)				DBT PE Protocol Completers (*n*=7)			
Outcome	**Time effect**	**Pre vs. Post**	**Pre vs. FU**	**Post vs. FU**	**Time effect**	**Pre vs. Post**	**Pre vs. FU**	**Post vs. FU**
PTSD	4.9_{32}^{***}	5.3_{33}^{***}	4.9_{32}^{***}	0.7_{31}	4.7_{19}^{***}	5.5_{19}^{***}	4.7_{19}^{***}	1.1_{19}
Suicidal ideation	3.7_{32}^{**}	3.2_{33}^{**}	3.7_{32}^{**}	0.3_{31}	3.0_{19}^{**}	2.8_{19}^{*}	3.0_{19}^{**}	0.1_{19}
Dissociation[ab]	$3.8_{2,\ 18}^{*}$	4.3_{13}^{**}	5.0_{7}^{**}	0.4_{21}	$5.8_{2,\ 7}^{*}$	3.3_{5}^{*}	3.1_{7}^{*}	0.2_{9}
Trauma-related guilt cognitions	2.1_{33}^{*}	2.8_{33}^{**}	2.1_{33}^{*}	0.8_{31}	1.7_{19}	1.9_{19}	1.7_{19}	0.2_{19}
Shame	2.2_{26}^{*}	3.0_{29}^{**}	2.2_{26}^{*}	1.0_{43}	$5.2_{2,\ 12}^{*a}$	3.6_{7}^{**}	3.3_{10}^{**}	0.1_{15}
Anxiety[a]	$1.9_{2,\ 19}$	3.2_{13}^{**}	1.8_{20}	1.0_{25}	$3.5_{2,\ 11}$	2.9_{6}^{*}	1.5_{8}	1.4_{14}
Depression[a]	$2.0_{2,\ 20}$	2.1_{14}	0.2_{23}	1.9_{26}	$2.0_{2,\ 12}$	2.3_{8}^{*}	0.1_{15}	1.5_{16}

Note. Unless otherwise specified, all models were hierarchical linear models and results are presented as t-values (t_{df}). FU = 3-month follow-up.

$^{*}p < .05$.

$^{**}p < .01$.

$^{***}p < .001$.

[a]Mixed model analyses of variance were used to account for the non-linearity of the data. In these models, the time effect statistic is an F-value ($F_{df1,\ df2}$).

[b]Two extreme outliers (i.e., values that were ± 2 SDs from the next closest value) were excluded from the analyses (one at post-treatment and one at 3-month follow-up).