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Alternatives to inpatient mental health care for children and young people

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Abstract

Background—Current policy in the UK and elsewhere places emphasis on the provision of mental health services in the least restrictive setting, whilst also recognising that some children will require inpatient care. As a result, there are a range of mental health services to manage young people with serious mental health problems who are at risk of being admitted to an inpatient unit in community or outpatient settings.

Objectives—1. To assess the effectiveness, acceptability and cost of mental health services that provide an alternative to inpatient care for children and young people.

2. To identify the range and prevalence of different models of service that seek to avoid inpatient care for children and young people.

Search methods—Our search included the Cochrane Effective Practice and Organisation of Care Group Specialised Register (2007), the Cochrane Central Register of Controlled Trials (*The Cochrane Library* 2006, issue 4), MEDLINE (1966 to 2007), EMBASE (1982 to 2006), the

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CONTRIBUTIONS OF AUTHORS Sasha Shepperd led on writing the protocol and review, screened studies for eligibility, extracted data and analysed the results. Helen Doll provided statistical advice, extracted data for the review, read and commented on the manuscript for this review. Mina Fazel and Jon Pollock commented on the manuscripts for the protocol and review and assisted with the extraction of data. Simon Gowers, Tony James and Ray Fitzpatrick provided advice throughout the review process and commented on the manuscripts for the protocol and review.
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DECLARATIONS OF INTEREST Simon Gowers is the principal investigator on one of the included trials.

INDEX TERMS
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Ambulatory Care [* methods]; Community Mental Health Services [* methods; organization & administration]; Crisis Intervention [* methods]; Family Therapy [* methods; organization & administration]; Home Care Services; Mental Disorders [* therapy]; Randomized Controlled Trials as Topic
MeSH check words
Adolescent; Child; Child, Preschool; Humans

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British Nursing Index (1994 to 2006), RCN database (1985 to 1996), CINAHL (1982 to 2006) and PsycInfo (1972 to 2007).

Selection criteria—Randomised controlled trials of mental health services providing specialist care, beyond the scope of generic outpatient provision, as an alternative to inpatient mental health care, for children or adolescents aged from five to 18 years who have a serious mental health condition requiring specialist services beyond the capacity of generic outpatient provision. The control group received mental health services in an inpatient or equivalent setting.

Data collection and analysis—Two authors independently extracted data and assessed study quality. We grouped studies according to the intervention type but did not pool data because of differences in the interventions and measures of outcome. Where data were available we calculated confidence intervals (CIs) for differences between groups at follow up. We also calculated standardised mean differences (SMDs) and 95% CIs for each outcome in terms of mean change from baseline to follow up using the follow-up SDs. We calculated SMDs (taking into account the direction of change and the scoring of each instrument) so that negative SMDs indicate results that favour treatment and positive SMDs favour the control group.

Main results—We included seven randomised controlled trials (recruiting a total of 799 participants) evaluating four distinct models of care: multi-systemic therapy (MST) at home, specialist outpatient service, intensive home treatment and intensive home-based crisis intervention (‘Homebuilders’ model for crisis intervention). Young people receiving home-based MST experienced some improved functioning in terms of externalising symptoms and they spent fewer days out of school and out-of-home placement. At short term follow up the control group had a greater improvement in terms of adaptability and cohesion; this was not sustained at four months follow up. There were small, significant patient improvements reported in both groups in the trial evaluating the intensive home-based crisis intervention using the ‘Homebuilders’ model. No differences at follow up were reported in the two trials evaluating intensive home treatment, or in the trials evaluating specialist outpatient services.

Authors’ conclusions—The quality of the evidence base currently provides very little guidance for the development of services. If randomised controlled trials are not feasible then consideration should be given to alternative study designs, such as prospective systems of audit conducted across several centres, as this has the potential to improve the current level of evidence. These studies should include baseline measurement at admission along with demographic data, and outcomes measured using a few standardised robust instruments.

BACKGROUND

Approximately 2100 young people in England and Wales are admitted to specialist child and adolescent mental health units each year (Worrall 2004). The main users of these services are those with eating (25%), mood (approximately 17%) and psychotic disorders (approximately 17%) (O’Herlihy 2003; O’Herlihy 2005). Although the actual number of young people being admitted is relatively small, the impact of these conditions on the young person can be severe and prolonged, and the accompanying use of resources high, particularly for 16 to 17 year olds (Goodman 2005). This has implications for a system where there is a shortage of specialised beds (Gowers 2005), with young people being

admitted to general psychiatric or paediatric wards when specialist care is not available (DOH 2004; Worrall 2004).

Although methods of case definition and ascertainment vary, the problems faced by other countries are broadly similar. In France, the emphasis is on providing services outside the hospital, however for those using the hospital for mental health services, 19% of inpatient psychiatric beds and 26% of day hospital places for young people are not in psychiatric hospitals (Provost 2001). In the United States, where the health system is fragmented by multiple providers, children with serious mental health problems receive care in a range of different settings which include the education and social services sectors (Burns 2001).

A range of mental health services, in the community or in an outpatient setting, have been developed to manage young people with serious mental health problems who are at high risk of being admitted to an inpatient unit (DOH 2004; NSF 2004). These alternative services may prevent young people from developing a dependency on the hospital environment or from being stigmatised. In addition, they may facilitate the transfer of any therapeutic gains to the young person's everyday environment, thus maximising the potential for sustaining improved health outcomes (Katz 2004) and for educational attainments to be less severely affected (Milin 2000). Examples include early intervention services in the community for young people with first episode psychosis (McGorry 2002), assertive outreach (McGorry 2002), dialectical behaviour therapy (Miller 2002), family therapy (Lock 2005) and multi-family therapy for anorexia nervosa (Scholz 2001). The way services are organised also differs. Service configurations include the provision of multi-agency integrated home care (DOH 2004), therapeutic units based in a day unit, or multi-agency services providing intensive specialist outpatient therapy for young people with severe mental health problems (Street 2003).

OBJECTIVES

1. To classify and describe the different organisational structures and therapeutic approaches described in the literature as alternatives to inpatient mental health services for children and young people.
2. To determine the effectiveness, acceptability and cost of alternatives to inpatient care for children and young people.

We planned to explore the following effect modifiers across studies: the therapeutic approach; the context of service provision, for example country, health system and rural versus urban setting; and service characteristics, for example the size of the service, the duration of the service and the organisation of the service. However, the limited data available prevented this.

METHODS

Criteria for considering studies for this review

Types of studies—Randomised controlled trials (including cluster-randomised trials), well designed controlled before-after studies (with a minimum of two sites in both the

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intervention and control groups) and interrupted time series where there was a clearly defined point in time when the intervention occurred and at least three data points before and three after the intervention. We included studies published in all languages.

Types of participants—Children and young people aged five to 18 years with a serious mental health condition requiring specialist services beyond the capacity of generic outpatient provision, i.e. a mental health problem causing extreme distress or severely limiting his or her life. The following types of mental health disorders were considered: anxiety disorders (including obsessive and compulsive disorders and somatoform disorders), conduct disorders, developmental disorders, eating disorders, mood disorders (depression and deliberate self harm; bipolar disorders), personality disorders, pervasive developmental disorders, psychotic disorders and substance related disorders. We also included patients described as suffering from non-specific emotional or behavioural disorders. We only included services admitting adults and young people if at least 75% of the study population were young people, or if the results were reported separately for adults and young people.

Types of interventions—Mental health services providing specialist care, beyond the capacity of generic outpatient provision, which provide an alternative to inpatient mental health care. The control group were young people receiving mental health services in an inpatient or equivalent setting. We also included studies comparing one or more alternative services if they included an inpatient, or equivalent, comparison. We classified and grouped interventions according to similarity using the descriptions of the interventions in the trial reports and related publications.

Types of outcome measures

Primary outcomes: Primary outcome measures included disease-specific symptoms, general psychological functioning, acceptability and cost.

Secondary outcomes: Secondary outcome measures included: admission rates to inpatient care, completion of treatment, use of out-of-home placement, length of stay, behavioural problems (measured using a validated scale), deliberate self harm, suicide, patient satisfaction, family functioning, satisfaction, acceptability and cost, return to school and school attainment where applicable, delinquency and substance abuse.

We excluded studies for the following reasons:

1. inclusion of an inpatient group that was clinically different at baseline from those admitted to the alternative service;
2. recruitment of children and adolescents with developmental disorders (other than pervasive developmental disorder), mild mental health disorders, and those receiving inpatient care for chronic physical illness or child abuse who had a co existing co-morbid mental health disorder;
3. the service was not described as an alternative to inpatient care, or there was no inpatient control or equivalent comparison group. For example, drug trials which did not address the therapeutic setting, and post-inpatient aftercare interventions.

Search methods for identification of studies—We searched the following electronic databases for primary studies:

1. the Cochrane Effective Practice and Organisation of Care (EPOC) Group Specialised Register (and the database of studies awaiting assessment) (see 'Specialised Register' under EPOC Module 2007) (searched 23 February 2007);
2. the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2006, issue 4) (searched January 2007);
3. the Cochrane Database of Systematic Reviews (searched November 2006);
4. bibliographic databases accessed through OVID:
    i. MEDLINE (1966+) (searched August 2007);
    ii. EMBASE (1982+) (searched October 2006);
    iii. British Nursing Index (1994+) (searched October 2006);
    iv. RCN database (1985 to 1996);
    v. CINAHL (1982 +) (searched November 2006);
    vi. PsycInfo (1972+) (searched August 2007);
5. other electronic resources including:
    i. the Health Management Information Consortium (DH Data) (searched November 2006);
    ii. the Database of Abstracts of Reviews of Effects (DARE) (searched December 2006); (http://www.york.ac.uk/inst/crd/crddatabases.htm#DARE);
    iii. Kings Fund (2003+) (searched December 2006);
    iv. Emerald;
    v. NELH Health Management Specialist Library (searched December 2006);
    vi. NHS Economic Evaluation Database (http://www.york.ac.uk/inst/crd/crddatabases.htm#NHSEED) (searched November 2006);
    vii. the Social Science Information Gateway (SOSIG) (searched November 2006);
    viii. the Turning Research into Practice (TRIP) database (http://www.tripdatabase.com/index.html) (searched November 2006);
    ix. CRDC (Central Research & Development Committee, Maternal and Child Health http://www.dh.gov.uk/en/Policyandguidance/Researchanddevelopment/A-Z/Motherandchildhealth/index.htm(searched November 2006);
    x. System for Grey Literature in Europe (SIGLE) (1980 to 2004);

xi. Dissertation Abstracts Online (1980+) (searched November 2006); and

xii. Young Minds (searched November 2006).

6. We hand searched the contents of the following child mental health journals between November 2006 and February 2007:

   i. Child & Adolescent Clinics of North America (http://childpsych.theclinics.com/issues) (2002+);

   ii. Child Psychiatry & Human Development (OVID) (1980+);

   iii. Journal of the American Academy of Child & Adolescent Psychiatry (http://www.jaacap.com/) (1966+);

   iv. International Journal of Partial Hospitalization (OVID) (1987+);

   v. Journal of Child & Family Studies (OVID) (1992+);

   vi. Journal of Child & Adolescent Psychiatric Nursing (OVID) (2004+);

   vii. International Journal of Eating Disorders (OVID)(1981+);

   viii. American Psychologist (OVID) (1967+);

   ix. Journal of Consulting & Clinical Psychology (OVID) (1980+);

   x. Psychiatric Services (OVID) (1967+);

   xi. British Journal of Psychiatry (OVID) (1969+);

   xii. Journal of Child Psychology & Psychiatry (OVID) (1967+);

   xiii. Mental Health Services Research (OVID) (2000+).

We checked bibliographies of retrieved papers. We contacted researchers working in the field of mental health to secure additional unpublished reports where available and to answer questions we had about the eligibility of studies.

Search strategies for primary studies incorporate the methodological component of the EPOC search strategy combined with selected index terms (for MEDLINE) and free text terms. We translated the MEDLINE search strategy for the other databases using the appropriate controlled vocabulary as applicable and used a three-step search strategy to identify relevant studies in all languages (see Appendix 1 for details of the search strategies for all databases).

Search methods step 1—Step 1 employed search terms related to the intervention and setting. In order to include all inpatient equivalents we did not include terms for the comparison groups (see Appendix 1 for details).

Search methods step 2—We searched Google and Google Scholar, exploring the sensitivity of a broader range of keywords than in step 1 to identify grey literature and other publications that had not been identified by step 1 (see Appendix 1 for details).

Search methods step 3—We used the terms from step 2 to supplement the terms used in step 1 to search all the bibliographical databases previously searched and combined these with the following search terms identified from step 2 (see Appendix 1 for details).

We updated the search in August 2007 to ensure we captured all articles recently added to MEDLINE and PsycInfo as these databases yielded the eligible studies in the earlier search. We used a broader set of search terms for the update to include more free text terms which we identified from the included studies (see Appendix 1 for details). We identified no new studies.

Data collection and analysis

Selection of studies—Two reviwers (LB and SS) read all the abstracts identified from the electronic search to identify publications that appeared to meet the inclusion criteria. As a first step, because case definition can vary between countries and over time, we relied on the place of care being described as an alternative to inpatient care (or an equivalent). The same two reviewers (LB and SS) independently read selected full publications and they selected studies for inclusion according to the pre-specified inclusion criteria. One author (SS) read the abstracts and full publications from the updated search in August 2007. Two child and adolescent psychiatrists (SG and TJ) read a sample of these publications (n = 20) to check the inclusion criteria were applied consistently. Disagreements were resolved by discussion. We contacted principal investigators if information was missing and to clarify the relevance of non-English language studies. If the authors of non-English papers could not be contacted we translated the relevant parts of the paper.

Data extraction and management—Two reviewers (SS, LB, HD, MF, JP, LH) independently extracted details of study design, population, intervention, control and outcome data from the included studies using a modified version of the EPOC data extraction form. We contacted authors for missing information.

Assessment of risk of bias in included studies—During the data extraction process two authors independently assessed the internal validity of each included randomised controlled trial with the following criteria: concealment of allocation, baseline measurement, follow up of professionals, follow up of patients or episodes of care, baseline measurement, blind assessment of primary outcome(s), standardised measurement of outcome, reliable primary outcome measure(s) and protection against contamination (see http://www.epoc.cochrane.org/en/index.html for full details) (EPOC Module 2007). In essence, we assessed studies for selection bias (how groups were assigned to the intervention or control), baseline assessment (did the groups differ in fundamental ways), performance bias (were any co-interventions reported in one group and not the other) and attrition bias (which was documented and described).

Assessment of heterogeneity—We planned to categorise studies and pool data by the type of intervention (organisational characteristics of the service and therapeutic approach) and study population. Although we did not pool the data from the included studies we used these categories to guide the presentation of the results.

Data synthesis—We have grouped studies according to the intervention type. Combining the data from the different studies was not possible as the interventions and measures of outcome differed. Empirical study outcomes are presented in summary tables. If follow-up data were available we calculated confidence intervals (CIs) for differences between groups to describe any differences in outcomes. These CIs reflect differences at outcome between groups without taking into account baseline group differences. This is because, while the studies generally presented baseline and follow-up scores, they did not usually present actual mean and standard deviation (SD) changes for each study group; it was therefore not possible to calculate the statistical significance of any group differences in terms of change from baseline. Moreover, different outcome measures were used across studies and thus the calculated 95% CIs cannot be directly compared.

To overcome both of these problems we calculated standardised mean differences (SMDs) and 95% CIs for each outcome in terms of the mean change from baseline to follow-up using the follow-up SDs. This method of using the follow-up SDs when the standard deviations of the change are not available (as in this review) was the method used by Gotzsche et al in their review of meta-analyses using SMDs (Gotzsche 2007). In each case we calculated the SMDs (taking into account the direction of change and the scoring of each instrument) so that negative SMDs indicate results that favour treatment and positive SMDs favour the control group. We presented the SMDs and 95% CIs in a forest plot for each study.

RESULTS

Description of studies

See: Characteristics of included studies; Characteristics of excluded studies.

Results of the search—Once duplicates had been removed, a total of 18,981 potentially relevant studies were identified using the search strategy described above. In total, we ordered 695 full text papers and ultimately identified and included seven randomised controlled trials recruiting a total of 783 participants. Non-randomised studies (well designed controlled before-after studies and interrupted time series) did not meet the pre-defined quality threshold and were excluded from the review. We did, however, use the information from these studies to help us identify the different organisational structures and therapeutic approaches described in the literature as alternatives to inpatient mental health services for children and young people.

Included studies

Study populations: Two trials evaluating multi-systemic therapy recruited young people with psychosis, suicide or homicide ideation, or threat of harm to self or others (Henggeler 1999), and young people with serious emotional and behavioural disorders requiring intensive mental health services and at risk of out-of-home placement (Rowland 2005). Young people with emotional and behavioural disorders who were referred to psychiatric services due to a mental health crisis were recruited to the trials evaluating intensive home based crisis intervention (enhanced ‘Homebuilders’ model for crisis intervention) (Evans

2003), intensive home treatment (Mattejat 2001; Winsberg 1980) and intensive specialist outpatient services (Silberstein 1968). Emotional and behavioural disorders cover a wide range of externalising and internalising conditions including conduct disorder, attention deficit and bipolar disorder. A second trial evaluating the effectiveness of specialist outpatient treatment recruited young people with anorexia nervosa (Gowers 2007).

Interventions

Multi-systemic therapy

Therapeutic approaches: Multi-systemic therapy (MST) follows a standard protocol and is a family-centred, ecologically orientated therapy targeting individual, family, peer and environmental aspects of psychopathology in the community (Henggeler 1999), and includes the development of aftercare plans (Henggeler 1999). Family therapy, behavioural therapy and cognitive behavioural therapy are used (Rowland 2005). Comprehensive crisis plans are developed jointly by the therapist and the child psychiatrist and focus on mobilising the problem-solving skills within the family and community (Henggeler 1999).

Family involvement: Families are required to participate with the MST treatment programme through direct participation in both the assessment and family therapy (Henggeler 1999). Family factors contributing to youth psychopathology are addressed as part of the intervention. Therapists work with families (three families per therapist) to design interventions that emphasise family empowerment and use family strengths as levers for change.

Operational characteristics: The MST service is available 24 hours a day, seven days per week (Henggeler 1999). Therapists work with the young people within their own homes, in collaboration with their primary care givers. However, if psychiatric hospitalisation is required then therapists continue to provide services in these clinical settings. The workload of each therapist was three families to one provider, and the reported duration of treatment was a mean of 123 days (SD 29 days) (Henggeler 1999). A standard protocol is used but the intensity of treatment is determined by the needs of the youth and their family; there was a mean of 97.1 hours of contact time (SD 57 hours) by one provider over 123 days (Henggeler 1999) compared with 12.07 hours per month (SD 4.62 hours) by another (Rowland 2005). This difference may also reflect the limited supply of therapists in the Rowland trial and difficulties with implementation.

Staff training: MST therapists are Masters level clinicians who are supervised by a child psychiatrist (Henggeler 1999; Rowland 2005). They receive training in MST methods which includes a five-day induction course followed by on-site training, ongoing supervision and quarterly on-site booster sessions (Henggeler 1999; Rowland 2005).

Intensive home-based crisis intervention (‘Homebuilders’ model for crisis intervention)

Therapeutic approaches: The focus of the ‘Homebuilders’ model is on the identification of family and individual psychosocial, cultural, community and welfare needs. Components include relationship building, reframing problems, anger management, communication,

setting treatment goals and cognitive behavioural therapy. The aim is to prevent an out-of-home placement for children at high risk. Short-term out-of-home placement from three days is permitted for respite care purposes in some cases.

Family involvement: Families are engaged in treatment through goal setting, supervising progress of children, working towards family goals with their children and behavioural management skills (Evans 2003).

Operational characteristics: Clinical services are provided to reflect the diverse needs of individuals and their families. Ongoing treatment support services such as respite care, support groups or day treatment programmes are provided. Follow-up contact sessions monitor progress and therapists may work with other agencies to provide comprehensive treatment. Food stamps, housing and other basic welfare services can be provided. Services can respond 24 hours a day and are time limited ranging from six to 12 weeks, with two families per therapist. Therapists are supervised by a child psychiatrist, who also provides consultation and referral services. Registered nurses and social workers with relevant employment experience are also involved with the treatment programme (Evans 2003).

Intensive home treatment

Therapeutic approaches: A problem-solving approach using a child and family centred approach is used, with importance placed on addressing difficulties with the psychosocial environment and alleviating individual psychiatric symptoms (Mattejat 2001).

Family involvement: In one trial parents were invited to address problems in their own lives, including maternal psychiatric distress (Winsberg 1980). Family therapy and crisis intervention techniques are used to assess the adolescent in the context of their family and develop therapeutic goals for the adolescent and their family. Parents are helped to support the adolescent function in new ways with the aim of returning to work or school.

Operational characteristics: The duration and intensity of the intervention varies between home treatment programmes, and may include the introduction of social services for the family (Winsberg 1980). Follow-up services may be provided in an outpatient setting (Winsberg 1980). Winsberg et al evaluated an intervention that lasted six months with each child spending between one to three weeks in psychiatric hospital at the beginning of treatment (Winsberg 1980). Some teams employ community based case workers or psychiatric nurses supervised by a child psychiatrist, with consultation services offered by an educational psychologist (Winsberg 1980).

Intensive specialist outpatient treatment

Therapeutic approaches: Silberstein et al described an intensive parental counselling programme involving weekly therapy sessions in behavioural management, combined with medication for children with emotional and behavioural disorders (Silberstein 1968). In the treatment of anorexia nervosa in the UK the service provided by specialist outpatient clinics included a motivational interview, cognitive behavioural therapy (CBT), parental

counselling, dietary therapy and multi-modal feedback on weight management and monitoring (Gowers 2007). This service was manualised and developed for the trial.

Family involvement: Parents can be involved in the treatment process through attendance at counselling sessions at specialist outpatient clinics (Silberstein 1968). Parental counselling was provided in the trial recruiting young people with anorexia nervosa (Gowers 2007).

Operational characteristics: One specialist outpatient service operated for a fixed period of 26 weeks (Silberstein 1968), and the other for six months (Gowers 2007). Specialist outpatient services are multi-disciplinary in their staffing arrangements; therapeutic teams usually include psychiatrists, social workers, psychiatric nurses and psychologists (Silberstein 1968). A trained member of the eating disorders team provided the CBT programme and parental counselling in the UK trial; the same therapist also provided feedback to the patient every six weeks. Dietetic therapy was provided by a trained dietician who worked as part of the team. Checks on treatment fidelity were made weekly at joint meetings between clinical and research staff. Travel time to the specialist services was usually under 90 minutes (Gowers 2007).

Risk of bias in included studies

Of the seven randomised controlled trials, one reported that concealment of allocation was adequate (Gowers 2007), and one followed up professionals delivering the intervention (Henggeler 1999). All the included RCTs reported patient or episode of care measures and baseline assessment. Blinded assessment of outcome was also achieved by all seven trials through the use of objective measures and, in the case of two trials, the use of blind raters (Gowers 2007; Mattejat 2001). Four reported a degree of attrition, with 74% follow up of patients achieved by Mattejat et al (Mattejat 2001), 80.4% by Evans et al (Evans 2003), 56.36% by Rowland et al (Rowland 2005) and 81% to 99% by Gowers et al (Gowers 2007) for the different outcomes measured. However, 100% follow up of patients was achieved by three trials (Henggeler 1999; Silberstein 1968; Winsberg 1980). Standardised measures of outcome were used in six of the studies (Evans 2003; Gowers 2007; Henggeler 1999; Mattejat 2001; Rowland 2005; Silberstein 1968) and protection against contamination was adequately reported in six trials, with the exception of Evans 2003. All of the trials were small, ranging from 55 participants (Rowland 2005) to 238 participants in a three-arm trial (Evans 2003).

Effects of interventions

Rates of hospitalisation and psychosocial functioning using a range of objective and subjective measures were the most commonly reported outcomes. Summary tables of study results are presented in further detail in Analysis 6.1. Standardised mean differences (SMDs) are reported below for multi-systemic therapy (Henggeler 1999; Rowland 2005), family preservation services (Evans 2003), intensive home treatment (Mattejat 2001; Winsberg 1980) and intensive specialist outpatient treatment (Gowers 2007; Silberstein 1968). Mean differences with 95% confidence intervals (CIs) at follow up and details of the measurement scales are also reported in Analysis 6.1, to indicate when baseline differences occurred and to provide a more interpretable unit of measurement. No randomised controlled trials

evaluating intensive day unit treatment, intensive case management, therapeutic foster care or residential care as an alternative to inpatient care (or a service of equivalent intensity) were identified.

1. Multi-systemic therapy at home—Two randomised controlled trials, both set in the United States, evaluated the effectiveness of multi-systemic therapy delivered in a home setting as an alternative to an inpatient admission (Henggeler 1999; Rowland 2005).

Multi-systemic therapy at home versus inpatient care for psychosis: Henggeler et al compared multi-systemic therapy (MST) at home with inpatient care for young people (mean age 13 years) who were eligible for an emergency psychiatric admission at the Medical University of South Carolina due to psychosis, suicide or homicide ideation, or threat of harm to self or others (Henggeler 1999) (Analysis 1.1).

Global Severity Index: At four months there were no significant differences between groups on the Global Severity Index of brief symptoms, measured by the care giver (SMD 0.14, 95% CI −0.24 to 0.51; mean difference 0.11, 95% CI −0.339 to 0.119).

Child Behaviour Checklist - care giver assessment - external and internal symptoms: Small, significant differences were reported on the Child Behaviour Checklist measure of externalising symptoms when the control youth left hospital (mean difference 5.00, 95% CI 0.41 to 9.59); this became non-significant after taking into account baseline differences (SMD 0.11, 95% CI −0.27 to 0.48). This was also not significant at four months follow up (SMD −0.25, 95% CI −0.63 to 0.13). No significant differences were reported at either time period for internalising symptoms.

Child Behaviour Checklist - teacher assessment - external and internal symptoms: Small, non-significant differences were reported on the Child Behaviour Checklist measure of externalising symptoms at four months follow-up (teacher reported mean difference: −3.20, 95% CI −7.96 to 1.56). After taking into account baseline differences, this became significant (SMD −0.52 95% CI −0.90 to −0.14). No significant differences were reported for internalising symptoms.

Family Adaptability and Cohesion Evaluation Scale - youth self-reported: At one to two weeks after recruitment small, significant differences favouring the control group were observed on the Family Adaptability and Cohesion Evaluation Scale (FACES) (adaptability subscale) when control participants left hospital (SMD 0.59, 95% CI 0.21 to 0.97; mean difference −3.4, 95% CI −6.22 to −0.583); and on the cohesion scale (SMD 0.41, 95% CI 0.03 to 0.79; mean difference −4.1, 95% CI −7.76 to −0.49). These differences were reduced at four months follow up, with the FACES adaptability subscale just reaching significance (SMD 0.39, 95% CI 0.01 to 0.76).

Family Adaptability and Cohesion Evaluation Scale - care giver assessment: Care givers of MST reported non-significant improvements in cohesion at the time when control participants left hospital (SMD 0.06, 95% CI −0.32 to 0.43; mean difference −4.30, 95% CI −6.86 to 1.74), and at four months when those allocated to MST were discharged (mean

difference −3.00, 95% CI −2.76 to 2.16). Taking into account baseline differences this became significant at four months follow up (SMD −0.55, 95% CI −0.93 to −0.17).

Days out of school, self-reported alcohol use: At four months follow-up MST youth spent fewer days out of school than control youth (SMD −0.47, 95% CI −0.85 to −0.09; mean difference −23 days, 95% CI −41.6 to −4.38, P < 0.018;), and reported significantly less alcohol use compared with the control group when baseline differences were taken into account (SMD −0.49, 95% CI −0.87 to −0.11; mean difference 0.07, 95% CI −1.20 to 1.34).

Self reported marijuana use, arrested: At four months follow-up there were no significant differences between the groups in self-reported marijuana use (SMD 0.04, 95% CI −0.34 to 0.41; mean difference 1.47 95% CI −3.32 to 6.26) or number of arrests (SMD −0.22 95% CI −0.60 to 0.16; mean difference 0.06, 95% CI −0.112 to 0.232).

Youth and care giver satisfaction: MST youth reported greater satisfaction with their treatment programme at the time when control youth left hospital (SMD −0.77, 95% CI −1.16 to −0.38; mean difference 2.40, 95% CI 0.77 to 4.00), as well as at four months follow-up (SMD −0.77, 95% CI −1.16 to −0.38; mean difference 3.50, 95% CI 1.78 to 5.22). Care givers also reported significantly more satisfaction with MST compared with controls at one to two weeks follow- up (SMD −0.41, 95% CI −0.79 to −0.03; mean difference 1.10, 95% CI −0.13 to 2.33) and at four months follow-up (SMD −0.41, 95% CI −0.79 to −0.03; mean difference 1.50, 95% CI 0.12 to 2.88).

In another publication of this trial, Schoenwald et al report that 25/57 (43.8%) of MST youth were hospitalised at least once between baseline and four months follow up. Furthermore, 11/56 (19.6%) of the control youth were re-hospitalised after discharge (difference 24%, 95% CI 7.7% to 40.8%). The mean length of stay (in days) per hospital episode was 3.78 (SD 5.04) for MST youth and 6.06 (SD 4.05) for control youth (mean difference −2.28, 95% CI −4.37 to −0.19) (Schoenwald 2000).

Sheidow et al examined the treatment costs for 115 Medicaid recipients who participated in this trial, finding statistically significant differences between MST youth and inpatient youth for treatment costs (excluding the costs of MST) over four months (mean difference −$3489, 95% CI −$5741 to −$1237, P= 0.0004) (Sheidow 2004).

Multi-systemic therapy (MST) at home versus intensive community care for emotional-behavioural difficulties: A second trial (Rowland 2005), evaluating multi-systemic therapy at home was based in Hawaii and recruited young people eligible for mental health services due to serious mental health problems. Community controls received mental health services which were co-ordinated by case managers and could include individual and family therapy, intensive home services, medication management, therapeutic foster care, group home treatment, day treatment, therapeutic aide services and hospital-based residential treatment. The attrition rate during the course of this trial was high, with 42% (11/26) of the MST group and 45% (13/29) of the control group not completing follow up. In addition, there were problems with treatment fidelity during the course of the trial, which reflected a limited supply of therapists available to implement the intervention. Means at follow up, with 95%

CI, are presented below, together with standardised mean differences (SMD) at follow- up (Analysis 2.1).

Child Behaviour Checklist - youth reported: Small, non-significant differences were reported on the Child Behaviour Checklist for internalising symptoms (SMD −0.55, 95% CI −1.27 to 0.17; mean difference −1.93, 95% CI −11.1 to 7.29) and externalising symptoms (SMD −0.47, 95% CI −1.19 to 0.24; mean difference −2.47, 95% CI −11.7 to 6.77).

Child Behaviour Checklist - care giver reported: Non-significant differences were reported on the Child Behaviour Checklist for internalising symptoms (SMD −0.13, 95% CI −0.90 to 0.65; mean difference 1.20, 95% CI −9.17 to 11.6;) and externalising symptoms assessed by the care giver (SMD −0.20, 95% CI −0.91 to 0.51; mean difference 1.33, 95% CI −7.13 to 9.79).

Family adaptability and cohesion: No significant differences were observed between groups on the family adaptability and cohesion scale at six months (adaptability: SMD −0.33, 95% CI −1.04 to 0.38; mean difference 3.16, 95% CI −0.26 to 6.01; cohesion: SMD 0.11, 95% CI −0.60 to 0.81; mean difference −2.63, 95% CI −6.38 to 1.12).

Youth risk behaviour: Non-significant differences were observed for self-reported minor delinquency, which became significant after adjusting for baseline differences (SMD −2.72, 95% CI −3.71 to −1.72; mean difference 2.14, 95% CI −2.98 to 7.19). There was also a significant reduction on the Youth Risk Behaviour Score for those receiving MST (SMD −0.90, 95% CI −1.64 to −0.16; mean difference 0.87, 95%CI −1.80 to 0.06).

Total drug use, self-reported index offences and minor delinquency: At six months there were no significant differences between groups for self-reported total drug use (SMD −0.62, 95% CI −1.34 to 0.10; mean difference 11.2, 95% CI −0.187 to 22.6) and index offences (SMD −0.24, 95% CI −0.95 to 0.46; mean difference 2.20, 95% CI −3.82 to 8.22). Those allocated to MST reported significantly fewer incidents of minor delinquency between baseline and follow up when baseline differences were taken into account (SMD −2.72, 95% CI −3.71 to −1.72; mean difference 2.14, 95% CI −2.98 to 7.19).

Out-of-home placement and hospital admission: Small, significant differences were observed in monthly days of out-of-home placement favouring those allocated to MST (SMD −0.91, 95% CI −1.65 to −0.17; mean difference, −8.08, 95% CI −14.6 to −1.55). Use of psychiatric hospitalisation for youth receiving MST was 0.53 days per month compared with 3.88 days per month for control youth at six month follow up.

Satisfaction - care giver: There were small, non-significant differences for satisfaction with social support (mean difference 2.59, 95% CI −3.28 to 8.4).

2. Intensive home-based crisis intervention ('Homebuilders' model for crisis intervention)—We include one randomised controlled trial (Evans 2003), based in the United States, which evaluated the effectiveness of an intensive home-based crisis

intervention (‘Homebuilders’ model for crisis intervention), set up to prevent psychiatric admission (Analysis 3.1).

Intensive home-based crisis intervention ‘Homebuilders’ programme versus an intensive home based crisis intervention ‘Homebuilders’ enhanced programme versus crisis case management: This three-armed randomised trial evaluated the relative effectiveness of an intensive home based crisis intervention ‘Homebuilders’ programme versus an intensive home based crisis intervention ‘Homebuilders’ enhanced programme versus a crisis case management service as alternatives to hospitalisation (Evans 2003). We report results for those allocated to the intensive home-based enhanced ‘Homebuilders’ programme which was provided in the home versus crisis case management which provided co-ordination of services and psychiatric referral. Research participants were children with emotional and behavioural disorders experiencing a psychiatric crisis requiring hospitalisation.

Family Adaptability Cohesion Scale and social behaviour: At discharge (four to six weeks after recruitment) there were small, significant differences favouring the ‘Homebuilders’ enhanced programme on the Family Adaptability Cohesion Scale (FACES) cohesion subscale (SMD −0.56, 95% CI −0.89 to −0.23; mean difference 4.53, 95 % CI 1.11 to 7.95); and in behaviours that supported social networks (SMD −0.39, 95% CI −0.72 to −0.06; mean difference 10.7, 95% CI 0.40 to 20.9). These differences were not significant at six months follow up.

Child Behaviour Checklist and the Piers Self Concept Scale: The control group showed greater improvements on the Child Behaviour Checklist (CBC) internal score at discharge, after baseline differences had been taken into account (SMD 0.46, 95% CI 0.13 to 0.79; mean difference 1.36, 95% CI −2.01 to 4.73) and the CBC total score (SMD 0.39, 95% CI 0.06 to 0.72; mean difference −0.89, 95% CI −4.04 to 2.26). These differences disappeared at six months follow-up, although those receiving ‘Homebuilders plus’ had a greater score on the CBC social competency score (SMD −0.34, 95% CI −0.67 to −0.01; mean difference 0.21, 95% CI −1.57 to 1.99). The control group reported a greater increase in self esteem measured by the Piers Self Concept Scale (SMD 0.39, 95% CI 0.06 to 0.72; mean difference −0.76, 95% CI −3.72 to 2.20) at six months follow up.

3. Intensive home treatment—Two randomised controlled trials (Mattejat 2001; Winsberg 1980) evaluated the effectiveness of intensive home treatment as an alternative to inpatient psychiatric admission. One study was based in Germany (Mattejat 2001) and the other in the United States (Winsberg 1980).

Home-based treatment versus inpatient treatment: Mattejat et al evaluated an intensive psychotherapeutic home-based treatment in two regions of Germany, Marburg and Mannheim, for children with emotional-behavioural disorders. No statistically significant differences were observed between inpatient and home treated children in terms of the number of marked symptoms or adaptation to school or work at two to five year follow-up (Mattejat 2001) (Analysis 4.1).

In a second home treatment study recruiting children with emotional and behavioural disorders, Winsberg et al reported no statistically significant differences between parental satisfaction with home services compared with inpatient care. At 1.5 to three year follow-up, 12/24 (50%) of children treated in hospital were living at home compared with 18/25 (72%) of children who had been treated in the community. The psychosocial outcomes from this trial are not included in this systematic review because they were deemed unreliable due to different raters assessing the treatment and control groups (Winsberg 1980).

4. Intensive specialist outpatient services—Two randomised controlled trials evaluated the effectiveness of intensive specialist outpatient treatment, one in the US (Silberstein 1968) and one in the UK (Gowers 2007).

Intensive outpatient services versus generic outpatient counselling (with or without drug treatment): One randomised controlled trial evaluated the effectiveness of intensive outpatient services compared with generic outpatient counselling (with or without drug treatment) for children with emotional and behavioural disorders (Silberstein 1968). This four-arm trial also evaluated the impact of parental counselling and child drug therapy on psychiatric hospital use. There were no statistically significant differences between the families receiving some active intervention and those receiving a placebo drug with no counselling in terms of being hospitalised or requests for hospitalisation being made over 26 weeks, getting into police difficulties, being judged as community adjusted or remaining in a regular classroom. Overall, 45/48 children were retained in the community over the 26 week trial period but there were 22 parental requests for hospitalisation related to 16 children during this time. It was not possible to calculate SMDs with the available data.

Specialist outpatient services versus inpatient care versus generic outpatient care: Gowers et al assessed the cost-effectiveness of a specialist outpatient service as an alternative to inpatient care, and compared this type of care with inpatient care or generic outpatient care for adolescents with anorexia nervosa in the United Kingdom. At two-year follow up no statistically significant differences were observed between the inpatient group and the specialist outpatient group in terms of the number of post-discharge nights spent at an inpatient facility, outpatient appointments or day patient contacts. Clinical costs of care per patient over two years based on their use of in-patient, outpatient, day hospital and Accident & Emergency (A&E) services did not differ. Furthermore, there were no statistically significant differences between groups in terms of overall cost of care per patient when clinical, educational and community services were combined. Those allocated to general outpatients used more resources compared with the other two groups, which is reflected by an increased, though non-significant, cost. The control group had significantly fewer A&E contacts, though this translates to a mean of 1 (SD 2) contacts in the specialist outpatient group, compared with a mean of 0 (SD 1) contacts in the other two groups (Gowers 2007). No differences between groups were reported for any of the outcomes measured (Gowers 2007) (Analysis 5.1).

DISCUSSION

We identified eight distinct models of care providing an alternative to inpatient mental health care for children and adolescents: multi-systemic therapy (MST), intensive home-based crisis intervention ('Homebuilders' model for crisis intervention), intensive outpatient services (which could include rapid outreach and crisis intervention), intensive home treatment, day hospitals, case management, therapeutic foster care and short-term residential care. No randomised evidence was identified comparing intensive day treatment, intensive case management, therapeutic foster care or residential care with inpatient care or another alternative type of care.

Two randomised controlled trials evaluated the effectiveness of MST in the community as an alternative to inpatient or intensive community treatment (Henggeler 1999; Rowland 2005). In both trials a number of different outcomes were measured using self, care giver and teacher reported data. The majority of differences were not significant. Henggeler et al reported improved functioning in terms of externalising symptoms for young people receiving home based MST. They also spent fewer days out of school and reported greater consumer satisfaction with their treatment programme. At short-term follow up the control group had a greater improvement in terms of adaptability and cohesion, though this was not sustained at four months follow up. Rowland et al reported fewer days spent in out-of-home placement for the MST group. A Cochrane Review of intensive MST for families and youth with social, emotional and behavioural problems across a range of settings found no evidence to support the use of this type of treatment compared with other interventions. However, this reflects the poor quality of the research evidence rather than the actual effectiveness of individual alternative services (Littell 2005).

Evidence for intensive home based crisis intervention using the 'Homebuilders' model for crisis intervention as an alternative to inpatient care came from one randomised controlled trial (RCT) (Evans 2003). Although no differences were observed in either group for number of days in out-of-home placement, small improvements favouring the control group were reported at short-term follow up for behaviour, and favouring those receiving the enhanced 'Homebuilders' service in terms of adaptability and cohesion. At six-month follow up this group also had a greater improvement in social competency compared with the control group. However, the control group had a greater improvement in self concept.

Evidence for intensive home treatment came from two RCTs (Mattejat 2001; Winsberg 1980), with no differences between groups at follow up. These findings do not differ from a systematic review of home treatment for people with mental health problems, where the majority of participants were over the age of 18 years, which concluded that the evidence base for the effectiveness of this service was weak (Burns 2001).

Two RCTs evaluated the effectiveness of intensive specialist out-patient services and both reported no differences in behavioural or psychological outcomes for those receiving this form of care compared with children receiving no treatment (Silberstein 1968), inpatient care or generic outpatient care (Gowers 2007). Gowers et al concluded that specialist outpatient services for young people with anorexia nervosa are as effective as inpatient care.

Cost effectiveness

An analysis of costs was attempted by one of the trials evaluating intensive home-based MST as an alternative to inpatient treatment (Henggeler 1999). However, the costs of the MST intervention and any outliers were omitted, therefore limiting the degree to which these results can be generalised. A second trial, reporting the results of the first economic evaluation of specialist outpatient care versus inpatient care versus generic outpatient care for adolescents with anorexia nervosa, reported no difference in costs between the three groups at two-year follow up. Interestingly, observed nonsignificant differences were due to the length of time spent in hospital, with the general outpatient group spending almost as much time in hospital as the inpatient group (Gowers 2007). This lack of evidence on cost effectiveness is consistent with a recent report on the limited evidence from economic evaluations of early intervention services for psychosis (McCrone 2007).

Methodological issues

Methodological limitations and a lack of evidence restrict the extent to which data from randomised studies can inform decision making. The quality of the studies included in this review was variable and most studies were under powered. Only one trial reported adequate concealment of allocation (Gowers 2007). Multiple testing was a problem for all studies with the risk of reporting a significant result by chance. In some studies up to 30 statistical tests were conducted with no adjustment for repeated testing. Many studies failed to report key features of the intervention, such as the duration or intensity of treatment, the staff involved or specific training requirements. This has important implications for replicating these interventions in future research, assessing treatment fidelity across studies, and for the development and implementation of evidence-based research programmes. Although obvious differences between the interventions can be identified, it is not possible to define the active ingredient within these interventions as each comprises a number of elements. Defining the precise therapeutic elements is also complex, including as they do the removal of the young person from their home in addition to prescribed therapies or drugs. Furthermore, standardising inpatient care is not possible as programmes differ in the make up of the multi-disciplinary teams they employ and the use of various therapies.

Defining the intervention and control

Over the last three decades the emphasis in several countries has been on the provision of mental health services for children in the least restrictive setting. In some cases this is a drive to control costs, but more often it reflects the policy of providing flexible and local child and adolescent mental health services that are perceived to confer a therapeutic advantage. For the purpose of this review the move towards alternative models that avoid inpatient care created some difficulties in selecting eligible studies as the type of care received by the control group was not always inpatient care but another community based alternative. In addition, it was sometimes difficult to disentangle services which aimed ultimately to avoid hospital admission through the provision of an innovative service as data were not provided to ascertain if this was achieved. A further complicating factor is the threshold for admission which tends to be broader for these alternative services compared with inpatient care, albeit recognising that thresholds will vary across inpatient services. As

a result some patients admitted to these alternative services may not have been admitted to inpatient care. Of note, the expectation for some of the models providing an alternative to inpatient care was that the service would be provided for longer than the inpatient equivalent (Henggeler 1999).

AUTHORS' CONCLUSIONS

Implications for practice

Extrapolating from a mainly North American evidence base to make recommendations about practice has some difficulties due to the multi-payer system of health care, variation in the way young people access and use mental health care services and the large number of uninsured children who do not qualify for public sector services. However, despite these difficulties there are some marked similarities regarding the policy focus across countries of providing flexible, local care for these young people in the least restrictive setting (Burns 2001; DOH 2004). The profile of young people admitted to these alternative services, the availability of local inpatient treatment, developing a systems approach to forge links between different agencies providing services (for example, exploring how mental health services operate within welfare and secure settings) and engaging families in treatment are all factors that need to be considered when developing these alternative services.

Implications for research

Given the current concerns about the scale and management of mental health problems in children and adolescents, a high priority should be attached to improvements in the quality of the evidence base which currently provides very little guidance for the development of services. The evidence highlights the need to move beyond monitoring and identifying variation in the types of services that are delivered, to the collection of robust data on the profile and outcomes of users of these alternative services. We suggest studies should be designed to compare different models of alternative services in terms of effectiveness and cost, focusing on those services that are most prevalent. For example, comparing intensive day treatment with home treatment or intensive outpatient treatment. It might be simpler in the first instance to design studies for services of specific disorders or symptoms (e.g. eating disorders, early onset psychosis) in order to compare data across sites. It may not be feasible to conduct a randomised controlled trial of these interventions due to difficulties in obtaining consent when one of the alternatives is inpatient care and problems with treatment fidelity. Implementing prospective comparative systems of audit are an alternative. By this we mean the prospective collection of data across several centres, which will include baseline measurement at admission along with demographic data. Outcomes should be measured using a few standardised robust instruments, for example the HoNOSCA system which has both clinical (Gowers 1999) and user rated versions (Gowers 2002). This would allow comparisons to be made of the differential effect of these services for children compared with adolescents, and between the different diagnostic categories.

Interestingly, few of the studies included in the review mentioned whether they consulted with service users and their parents, or the professionals treating them. This has made it difficult to establish the acceptability of the various alternative interventions included in this

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systematic review. Only two randomised controlled trials (Henggeler 1999; Winsberg 1980) included any measure of patient or care giver satisfaction. This has important implications for understanding the compliance and attrition problems associated with the delivery of mental health interventions. The evidence base would be improved by obtaining service users' views on any alternative service through qualitative research.

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SOURCES OF SUPPORT

Internal sources

- No sources of support supplied

External sources

- The NIHR SDO Programmes is funded by the Department of Health, UK.

Appendix 1: APPENDICES

Search strategies

Randomised controlled trials (Cochrane sensitive search strategy)

1 randomized controlled trial.pt.

2 controlled clinical trial.pt.

3 randomized controlled trials.sh.

4 random allocation.sh.

5 double blind method.sh.

6 single blind method.sh.

7 1 or 2 or 3 or 4 or 5 or 6

8 (animals not human).sh.

9 7 not 8

10 clinical trial.pt.

11 exp clinical trials/

12 (clin$ adj25 trial$).ti,ab.

13 ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab.

14 placebos.sh.

15 placebo$.ti,ab.

16 random$.ti,ab.

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17 research design.sh.

18 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17

19 18 not 8

20 19 not 9

21 comparative study.sh.

22 exp evaluation studies/

23 follow up studies.sh.

24 prospective studies.sh.

25 (control$ or prospectiv$ or volunteer$).ti,ab.

26 21 or 22 or 23 or 24 or 25

27 26 not 8

28 27 not (9 or 20)

29 9 or 20 or 28

Settings of care

30 Residence Characteristics/

31 Home Care Services/

32 Outpatients/

33 Ambulatory Care/

34 Residential Treatment/

35 Day Care/

36 Foster Home Care/

37 Health Facilities, Proprietary/ or Skilled Nursing Facilities/ or Assisted Living Facilities/ or Ambulatory Care Facilities/ or Intermediate Care Facilities/ or Residential Facilities/ or Health Facilities/

38 prison$.mp. or Prisons/

39 residential facilities/ or assisted living facilities/ or group homes/ or halfway houses/ or nursing homes/ or orphanages/

40 Child Day Care Centers/ or child day care centres.mp.

41 community$.mp. [mp=title, original title, abstract, name of substance word, subject heading word]

42 alternative$.mp. [mp=title, original title, abstract, name of substance word, subject heading word]

43 (school$ or schools).mp. [mp=title, original title, abstract, name of substance word, subject heading word]

44 exp Substance Abuse Treatment Centers/

45 ((outpatient or home or residential) adj care).tw.

46 ((outpatient or day) adj clinic?).tw.

47 day clinic.tw.

48 early intervention.tw.

49 (outreach adj (treatment or program$ or assertive or community)).tw.

50 (assertive adj (treatment or community)).tw.

51 (mental adj service$).tw.

52 (psychiatr$ adj service$).tw.

53 dialectical behavio?r therapy.tw.

54 Family Therapy/

55 or/30-54

56 (CHILD or ADOLESCENT).mp.

Diagnostic categories

57 anxiety disorders/ or agoraphobia/ or neurocirculatory asthenia/ or ((obsessive or compulsive) adj disorder).mp. or panic disorder/ or phobic disorders/ or stress disorders, traumatic/

58 eating disorders/ or anorexia nervosa/ or bulimia nervosa/ or coprophagia/ or pica/ or (eating adj disorder).mp. [mp=title, original title, abstract, name of substance word, subject heading word]

59 mood disorders/ or affective disorders, psychotic/ or bipolar disorder/ or depressive disorder/ or depression, depressive disorder, major/ or dysthymic disorder/ or (bipolar adj disorder).mp. [mp=title, original title, abstract, name of substance word, subject heading word]

60 somatoform disorders/ or conversion disorder/ or hypochondriasis/ or neurasthenia/

61 “attention deficit and disruptive behavior disorders”/ or attention deficit disorder with hyperactivity/ or conduct disorder/

62 personality disorders/ or antisocial personality disorder/ or borderline personality disorder/ or compulsive personality disorder/ or dependent personality disorder/ or histrionic personality disorder/ or paranoid personality disorder/ or passive-aggressive personality disorder/ or schizoid personality disorder/ or schizotypal personality disorder/

63 child development disorders, pervasive/ or asperger syndrome/ or autistic disorder/ or rett syndrome/ or schizophrenia, childhood/

64 “schizophrenia and disorders with psychotic features”/ or capgras syndrome/ or paranoid disorders/ or psychotic disorders/ or psychoses, substance-induced/ or schizophrenia/

65 substance-related disorders/ or alcohol-related disorders/ or amphetamine-related disorders/ or cocaine-related disorders/ or marijuana abuse/ or opioid-related disorders/ or phencyclidine abuse/ or psychoses, substance-induced/ or substance abuse, intravenous/ or substance withdrawal syndrome/

66 self-injurious behavior/ or self mutilation/ or suicide/ or suicide, attempted/

67 29 and 55 and 56 and 57

68 29 and 55 and 56 and 58

69 29 and 55 and 56 and 59

70 29 and 55 and 56 and 60

71 29 and 55 and 56 and 61

72 29 and 55 and 56 and 62

73 29 and 55 and 56 and 63

74 29 and 55 and 56 and 64

75 29 and 55 and 56 and 65

76 29 and 55 and 56 and 66

Search methods: non-randomised quantitative studies

(Settings of care)

1 Residence Characteristics/

2 Home Care Services/

3 Outpatients/

4 Ambulatory Care/

5 Residential Treatment/

6 Day Care/

7 Foster Home Care/

8 Health Facilities, Proprietary/ or Skilled Nursing Facilities/ or Assisted Living Facilities/ or Ambulatory Care Facilities/ or Intermediate Care Facilities/ or Residential Facilities/ or Health Facilities/

9 prison$.mp. or Prisons/

10 residential facilities/ or assisted living facilities/ or group homes/ or halfway houses/ or nursing homes/ or orphanages/

11 Child Day Care Centers/ or child day care centres.mp.

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12 community$.mp. [mp=title, original title, abstract, name of substance word, subject heading word]

13 alternative$.mp. [mp=title, original title, abstract, name of substance word, subject heading word]

14 (school$ or schools).mp. [mp=title, original title, abstract, name of substance word, subject heading word]

15 exp Substance Abuse Treatment Centers/

16 ((outpatient or home or residential) adj care).tw.

17 ((outpatient or day) adj clinic?).tw.

18 day clinic.tw.

19 early intervention.tw.

20 (outreach adj (treatment or program$ or assertive or community)).tw.

21 (assertive adj (treatment or community)).tw.

22 (mental adj service$).tw. 1

23 (psychiatr$ adj service$).tw.

24 dialectical behavio?r therapy.tw.

25 Family Therapy/

26 or/1-25

(Target population)

27 (CHILD or ADOLESCENT).mp.

(Diagnostic categories)

28 anxiety disorders/ or agoraphobia/ or neurocirculatory asthenia/ or ((obsessive or compulsive) adj disorder).mp. or panic disorder/ or phobic disorders/ or stress disorders, traumatic/

29 eating disorders/ or anorexia nervosa/ or bulimia nervosa/ or coprophagia/ or pica/ or (eating adj disorder).mp.

30 mood disorders/ or affective disorders, psychotic/ or bipolar disorder/ or depressive disorder/ or depression, depressive disorder, major/ or dysthymic disorder/ or (bipolar adj disorder).mp.

31 somatoform disorders/ or conversion disorder/ or hypochondriasis/ or neurasthenia/

32 “attention deficit and disruptive behavior disorders”/ or attention deficit disorder with hyperactivity/ or conduct disorder/

33 personality disorders/ or antisocial personality disorder/ or borderline personality disorder/ or compulsive personality disorder/ or dependent personality disorder/ or histrionic personality disorder/ or paranoid personality disorder/ or passive-aggressive

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personality disorder/ or schizoid personality disorder/ or schizotypal personality disorder/

34 child development disorders, pervasive/ or asperger syndrome/ or autistic disorder/ or rett syndrome/ or schizophrenia, childhood/

35 “schizophrenia and disorders with psychotic features”/ or capgras syndrome/ or paranoid disorders/ or psychotic disorders/ or psychoses, substance-induced/ or schizophrenia/

36 substance-related disorders/ or alcohol-related disorders/ or amphetamine-related disorders/ or cocaine-related disorders/ or marijuana abuse/ or opioid-related disorders/ or phencyclidine abuse/ or psychoses, substance-induced/ or substance abuse, intravenous/ or substance withdrawal syndrome/

37 self-injurious behavior/ or self mutilation/ or suicide/ or suicide, attempted/

(Non-randomised methods)

38 “outcome assessment (health care)”/ or treatment outcome/ or “process assessment (health care)”/

39 exp epidemiologic methods/ or exp case-control studies/ or case control.mp. or exp research design/

40 cohort studies.mp. or exp cohort studies/

41 exp program evaluation/

42 follow up studies.mp. or exp follow-up studies/

43 or/38-42

(Combination of settings + target population + clinical diagnosis + research methods)

44 26 and 27 and 28 and 43

45 26 and 27 and 29 and 43

46 26 and 27 and 30 and 43

47 26 and 27 and 31 and 43

48 26 and 27 and 32 and 43

49 26 and 27 and 33 and 43

50 26 and 27 and 34 and 43

51 26 and 27 and 35 and 43

52 26 and 27 and 36 and 43

53 26 and 27 and 37 and 43

Step 2—Psychiatric AND alternative AND inpatient AND (child OR adolescent OR youth)

Psychiatric AND Day hospital AND (child OR adolescent OR youth)

Psychiatric AND Day clinic AND (child OR adolescent OR youth)

Psychiatric AND Outpatient AND (child OR adolescent OR youth)

Psychiatric AND Partial Hospitalization AND (child OR adolescent OR youth)

Psychiatric AND Residential AND (child OR adolescent OR youth)

Psychiatric AND Community AND (child OR adolescent OR youth)

Psychiatric AND Home AND (child OR adolescent OR youth)

The above searches were repeated replacing ‘psychiatric’ with the 10 specific disorders from the OVID searches (psychosis, eating disorders etc).

Additional searches were undertaken on specific treatment programmes: ‘Wraparound’ and ‘Treatment Foster Care’ using the above search terms and replacing mental disorders and psychiatric with emotional or behavioural.

Step 3—(((home treatment or crisis intervention or managed care or home treatment or “home-based” or treatment foster care or therapeutic group home or outpatient or residential or partial hospitalization or day hospital or day clinic or “alternative to hospitalization” or “alternative to hospitalisation” or “alternative to inpatient” or (alternative and inpatient) or (alternative and outpatient)) and (child or youth or adolescent) and (mental disorders or psychiatric)).mp.) NOT adult

Original OVID search output (RCT + non-RCT)

* Above strategy then repeated. (Mental disorders and psychiatric) replaced by (emotional or behavioural or behavioural), with duplicates removed.

Search methods for Medline OVID August 2007

1. ((psychiatric or emotional or behavio?ral or mental or anxiety or eating or mood or personality or psychotic or developmental or eating) adj5 disorder$).mp. [mp=ti, ot, ab, nm, hw]

2. (anorexia nervosa or bulimia or schizophren$ or depress$ or asperger or autism or autistic or substance abuse or suicide). mp. [mp= ti, ot, ab, nm, hw]

3. 1 or 2

4. (alternative and (inpatient or in-patient)).mp. [mp=ti, ot, ab, nm, hw]

5. day.mp. [mp=ti, ot, ab, nm, hw]

6. (outpatient$ or out-patient$).mp. [mp=ti, ot, ab, nm, hw]

7. partial hospital$.mp. [mp=ti, ot, ab, nm, hw]

8. residential.mp. [mp=ti, ot, ab, nm, hw]

9. community$.mp. [mp=ti, ot, ab, nm, hw]
10. home.mp. [mp=ti, ot, ab, nm, hw]
11. wraparound.mp. [mp=ti, ot, ab, nm, hw]
12. treatment foster care.mp. [mp=ti, ot, ab, nm, hw]
13. (multi-systemic or multisystemic).mp. [mp=ti, ot, ab, nm, hw]
14. or/4-13
15. (child$ or adolescen$ or youth$ or teenage$).mp. [mp=ti, ot, ab, nm, hw]
16. randomized controlled trial.pt.
17. controlled clinical trial.pt.
18. exp Randomized Controlled Trials/
19. exp Random Allocation/
20. exp Double-Blind Method/
21. exp single-blind method/
22. or/16-21
23. exp Animals/
24. exp Humans/
25. 24 not 23
26. 22 not 25
27. clinical trial.pt.
28. exp Clinical Trials/
29. (clin$ adj25 trial$).tw.
30. ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).tw.
31. Placebos/
32. placebo$.tw.
33. random$.tw.
34. Research Design/
35. or/27-34
36. 35 not 25
37. comparative study/
38. exp Evaluation Studies/
39. Follow-Up Studies/
40. Prospective Studies/

41. (control$ or prospectiv$ or volunteer$).tw.

42. or/37-41

43. 42 not 25

44. “outcome assessment (health care)”/ or treatment outcome/ or “process assessment (health care)”/

45. exp epidemiologic methods/ or exp case-control studies/ or case control.mp. or exp research design/ [mp=ti, ot, ab, nm, hw]

46. cohort studies.mp. or cohort studies/ [mp=ti, ot, ab, nm, hw]

47. exp program evaluation/

48. follow up studies.mp. or exp follow-up studies/ [mp=ti, ot, ab, nm, hw]

49. or/44-48

50. 26 or 36 or 43 or 49

51. 3 and 14 and 15 and 50

Search methods Ovid PsycInfo August 2007

1. outpatient treatment/

2. aftercare/

3. partial hospitalization/

4. exp crisis intervention services/

5. exp schools/

6. day care centers/

7. home care/

8. residential care institutions/ or halfway houses/ or nursing homes/ or group homes/

9. child day care/

10. family therapy/

11. community mental health centers/ or suicide prevention centers/ or psychiatric clinics/ or community facilities/

12. correctional institutions/ or prisons/ or reformatories/

13. prison$.mp.

14. community$.mp. [mp=title, abstract, heading word, table of contents, key concepts]

15. alternative$.mp. [mp=title, abstract, heading word, table of contents, key concepts]

16. ((outpatient or home or residential) adj care).tw.

17. ((outpatient or day) adj clinic$).tw.

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18. early intervention.tw.

19. (outreach adj (treatment or program$ or assertive or community)).tw.

20. (assertive adj (outreach or community)).tw.

21. (mental adj service$).tw.

22. (psychiatr$ adj service$).tw.

23. dialectical behavio?r therapy.tw.

24. or/1-23

25. (child or adolescent).mp. [mp=title, abstract, heading word, table of contents, key concepts]

26. exp anxiety disorders/

27. exp eating disorders/

28. exp affective disorders/

29. exp somatoform disorders/

30. exp attention deficit disorder/

31. exp personality disorders/

32. exp pervasive developmental disorders/

33. exp drug abuse/

34. suicide/ or attempted suicide/

35. self inflicted wounds/ or self mutilation/

36. exp psychosis/

37. or/26-36

38. 24 and 25 and 37

39. ((psychiatric or behavio?ral or emotional or mental or anxiety or eating or mood or personality or psychotic or developmental or eating) adj5 disorder$).mp. [mp=title, abstract, heading word, table of contents, key concepts]

40. (anorexia nervosa or bulimia or schizophren$ or depress$ or asperger or autism or autistic or substance abuse or suicide).mp. [mp= title, abstract, heading word, table of contents, key concepts]

41. 39 or 40

42. (alternative and (inpatient or in-patient)).mp. [mp=title, abstract, heading word, table of contents, key concepts]

43. day.mp. [mp=title, abstract, heading word, table of contents, key concepts]

44. (outpatient$ or out-patient$).mp. [mp=title, abstract, heading word, table of contents, key concepts]

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45. partial hospital$.mp. [mp=title, abstract, heading word, table of contents, key concepts]

46. residential.mp. [mp=title, abstract, heading word, table of contents, key concepts]

47. community$.mp. [mp=title, abstract, heading word, table of contents, key concepts]

48. home.mp. [mp=title, abstract, heading word, table of contents, key concepts]

49. wraparound.mp. [mp=title, abstract, heading word, table of contents, key concepts]

50. treatment foster care.mp. [mp=title, abstract, heading word, table of contents, key concepts]

51. (multi-systemic or multisystemic).mp. [mp=title, abstract, heading word, table of contents, key concepts]

52. or/42-51

53. (child or adolescen$ or youth$ or teenage$).mp. [mp=title, abstract, heading word, table of contents, key concepts]

54. 41 and 52 and 53

55. rct.tw.

56. random$.tw.

57. (clinical trial$ or clinical stud$).tw.

58. or/55-57

59. (cohort stud$ or cohort analysis).tw.

60. case control stud$.tw.

61. cross sectional stud$.tw.

62. follow up stud$.tw.

63. observational stud$.tw.

64. longitudinal stud$.tw.

65. prospective stud$.tw.

66. retrospective stud$.tw.

67. or/59-66

68. intervention.tw.

69. exp experimental design/ or experimental methods/ or quantitative methods/

70. 58 or 67 or 68 or 69

71. 38 and 70

72. 54 and 70

HISTORY

Protocol first published: Issue 1, 2007

Review first published: Issue 2, 2009

Date	Event	Description
27 August 2008	Amended	Converted to new review format
15 August 2008	New citation required and conclusions have changed	Substantive amendment

Appendix

CHARACTERISTICS OF STUDIES

Characteristics of included studies *[ordered by study ID]*

Evans 2003

Methods	RCT
Participants	Young people with emotional and behavioural disorders who were referred to psychiatric services due to a mental health crisis Number recruited=296 and 238 available at follow-up Home Builders Crisis Intervention=90 Enhanced Home Based Crisis Intervention=85 Crisis Case Management=63
Interventions	Family preservation service: the focus is on the identification of family and individual psychosocial, cultural, community and welfare needs. Components include relationship building, reframing problems, anger management, communication, setting treatment goals and cognitive behavioural therapy. The aim is to prevent an out-of-home placement for children at high risk. Short-term out-of-home placement from 3 days is permitted for respite care purposes in some cases. Services can respond 24 hours a day and are time limited, ranging from 6 to 12 weeks, with 2 families per therapist. Therapists are supervised by a child psychiatrist, who also provides consultation and referral services. Registered nurses and social workers also provide care
Outcomes	Standardised measures: Child Behaviour Checklist, severity, family adaptability and cohesion, self concept
Notes	Length of follow up: at discharge and 6 months

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Gowers 2007

Methods	RCT
Participants	Young people with anorexia nervosa aged between 11 years 11 months and 17 years 11 months (mean 14 years 11 months); 92% (N = 153) female; 76% (N = 127) restricting by subtype 24% (N = 40) binge purging subtype of anorexia nervosa. Mean length of history 13 months

Interventions	Specialist outpatient clinic: the service included a motivational interview, cognitive behavioural therapy (CBT), parental counselling, dietary therapy and multi-modal feedback on weight management and monitoring. This service was manualised and developed for the trial
Outcomes	Severity; eating cognitions, behaviours and social functioning; family functioning; mood and feelings
Notes	Length of follow-up: 1 and 2 years

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

Henggeler 1999

Methods	RCT
Participants	Young people with psychosis, suicide or homicide ideation, or threat of harm to self or others Number recruited N=116 (2 dropped out prior to randomisation and prior to assessment) T=57 C=56
Interventions	Multi-systemic therapy (MST) follows a standard protocol and is a family-centred, ecological orientated therapy targeting individual, family, peer and environmental aspects of psychopathology in the community and includes the development of aftercare plans. Family therapy, behavioural therapy and cognitive behavioural therapy are used. Comprehensive crisis plans are developed jointly by the therapist and the child psychiatrist and focus on mobilising the problem-solving skills within the family and community
Outcomes	Standardised measures: Child Behaviour Checklist, severity, alcohol and marijuana use, family adaptability and cohesion, youth and care giver satisfaction
Notes	Length of follow up: at 6 months post-intervention and at 11 months post-recruitment

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Mattejat 2001

Methods	RCT
Participants	Young people with emotional and behavioural disorders who were referred to psychiatric services due to a mental health crisis Number recruited =68
Interventions	Intensive home treatment using a problem-solving approach using a child and family centred approach with importance placed on addressing difficulties with the psychosocial environment and alleviating individual psychiatric symptoms
Outcomes	Standardised measures of symptoms and adaptation
Notes	Average length of follow up: 3 years and 8 months (range 2 years and 1 month to 5 years and 2 months)

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Unclear	B - Unclear

Rowland 2005

Methods	RCT
Participants	Young people with serious emotional and behavioural disorders requiring intensive mental health services and at risk of out-of-home placement Number recruited=55
Interventions	Multi-systemic therapy (MST) follows a standard protocol and is a family-centred, ecologically orientated therapy targeting individual, family, peer and environmental aspects of psychopathology in the community and includes the development of aftercare plans. Family therapy, behavioural therapy and cognitive behavioural therapy are used. Comprehensive crisis plans are developed jointly by the therapist and the child psychiatrist and focus on mobilising the problem-solving skills within the family and community
Outcomes	Standardised measures: Child Behaviour Checklist, severity, alcohol and drug use, family adaptability and cohesion, arrests and out-of-home placement
Notes	Length of follow up: at 6 months
Risk of bias	

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Silberstein 1968

Methods	RCT
Participants	Young people with emotional and behavioural disorders who were referred to psychiatric services due to a mental health crisis
Interventions	Intensive outpatient service provided intensive parental counselling programme involving weekly therapy sessions in behavioural management, combined with medication
Outcomes	Hospitalisation, school attendance, community adjustment
Notes	Length of follow-up: at 1, 13 and 26 weeks
Risk of bias	

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

Winsberg 1980

Methods	RCT
Participants	Young people with emotional and behavioural disorders who were referred to psychiatric services due to a mental health crisis
Interventions	Intensive home treatment: provided by community-based case workers or psychiatric nurses supervised by a child psychiatrist, with consultation services offered by an educational psychologist
Outcomes	Place at follow-up
Notes	Length of follow-up: 6 months
Risk of bias	

Item	**Authors' judgement**	**Description**
Allocation concealment?	Unclear	B - Unclear

RCT = randomised controlled trial

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Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Bath 1994	Evaluated a family preservation service that focused exclusively on social and welfare services and did not seek to provide an alternative to inpatient admission
Bergh 2002	Not an alternative to inpatient care
Berman 1988	Not an alternative to inpatient care
Brimblecombe 2003	Adults
Brown 1999	Not an alternative to inpatient care
Burns 2001	Adults only
Eisler 2000	Not an alternative to inpatient care
Erker 1993	Non-randomised; compared day treatment with long term residential treatment
Firth 1992	Pre/post-test design
Grizenko 1993	Non-randomised; not an alternative to inpatient care
Harrington 1998	Excluded because the intervention was a brief (5 sessions) family intervention delivered by child psychiatric social workers, with the first session being held in the hospital or home, and subsequent sessions at home. The control group received outpatient care by a psychiatrist or psychiatric nurse, this was less intensive than that described by Rowland and was not considered equivalent to inpatient care. We also looked at the economic evaluation of the Harrington trial by Gowers 2007 to assess the intensity of care in the control group, to ensure our decision to exclude this trial was consistent with the inclusion/exclusion criteria. Over 6 months outpatient attendance was 55/75 (73%) in the control group and (61%) in the intervention group, and hospital inpatient days were similar in both groups (number in control group having an inpatient day 70/75 (95%) versus intervention group 67/74 (91%)
Henngeler 1999	Not an alternative to inpatient care
Le Grange 1992	Comparison of two outpatient settings
Scholz 2001	Descriptive study

DATA AND ANALYSES

Comparison 1

Henggeler 1999 - multi-systemic therapy

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Patient assessed outcomes at 4 months Henggeler	1		SMDs (Fixed, 95% CI)	Totals not selected
1.1 Global severity index	1		SMDs (Fixed, 95% CI)	Not estimable
1.2 Child Behaviour Checklist (care giver) external	1		SMDs (Fixed, 95% CI)	Not estimable
1.3 Child Behaviour Checklist (care giver) internal	1		SMDs (Fixed, 95% CI)	Not estimable
1.4 Child Behaviour Checklist (teacher) external	1		SMDs (Fixed, 95% CI)	Not estimable
1.5 Child Behaviour Checklist (teacher) internal	1		SMDs (Fixed, 95% CI)	Not estimable
1.6 Family adaptability and cohesion scale (FACES) youth assessed, cohesion scale	1		SMDs (Fixed, 95% CI)	Not estimable
1.7 Family adaptability and cohesion scale (FACES) youth assessed, adaptability scale	1		SMDs (Fixed, 95% CI)	Not estimable

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.8 Family adaptability and cohesion scale (FACES) care giver assessed, cohesion scale	1		SMDs (Fixed, 95% CI)	Not estimable
1.9 Family adaptability and cohesion scale (FACES) care giver assessed, adaptability scale	1		SMDs (Fixed, 95% CI)	Not estimable
1.10 Days out of school	1		SMDs (Fixed, 95% CI)	Not estimable
1.11 Self-reported alcohol use	1		SMDs (Fixed, 95% CI)	Not estimable
1.12 Self-reported marijuana use	1		SMDs (Fixed, 95% CI)	Not estimable
1.13 Arrested	1		SMDs (Fixed, 95% CI)	Not estimable
1.14 Youth satisfaction	1		SMDs (Fixed, 95% CI)	Not estimable
1.15 Care giver satisfaction	1		SMDs (Fixed, 95% CI)	Not estimable

Comparison 2

Rowland 2005 - multi-systemic therapy

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Patient outcomes at 6 months - Rowland	1		SMD (Fixed, 95% CI)	Totals not selected
1.1 Child Behaviour Checklist - internalising - youth assessed	1		SMD (Fixed, 95% CI)	Not estimable
1.2 Child Behaviour Checklist - externalising - youth assessed	1		SMD (Fixed, 95% CI)	Not estimable
1.3 Child Behaviour Checklist - internalising - care giver assessed	1		SMD (Fixed, 95% CI)	Not estimable
1.4 Child Behaviour Checklist - externalising - care giver assessed	1		SMD (Fixed, 95% CI)	Not estimable
1.5 Family adaptability	1		SMD (Fixed, 95% CI)	Not estimable
1.6 Family cohesion	1		SMD (Fixed, 95% CI)	Not estimable
1.7 Youth risk behaviour	1		SMD (Fixed, 95% CI)	Not estimable
1.8 Total drug use	1		SMD (Fixed, 95% CI)	Not estimable
1.9 Minor delinquency	1		SMD (Fixed, 95% CI)	Not estimable
1.10 Self-reported index offences	1		SMD (Fixed, 95% CI)	Not estimable
1.11 Arrests per month	1		SMD (Fixed, 95% CI)	Not estimable
1.12 Out-of-home placement	1		SMD (Fixed, 95% CI)	Not estimable

Comparison 3

Evans 2003 - Family Preservation Services

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Patient outcomes at 6 months - Evans	1		SMD (Fixed, 95% CI)	Totals not selected
1.1 FACES adaptability scale	1		SMD (Fixed, 95% CI)	Not estimable
1.2 FACES cohesion scale	1		SMD (Fixed, 95% CI)	Not estimable

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1.3 Child Behaviour Checklist - total problems	1		SMD (Fixed, 95% CI)	Not estimable
1.4 Child Behaviour Checklist - internalising	1		SMD (Fixed, 95% CI)	Not estimable
1.5 Child Behaviour Checklist - externalising	1		SMD (Fixed, 95% CI)	Not estimable
1.6 Child Behaviour Checklist - social competency	1		SMD (Fixed, 95% CI)	Not estimable
1.7 Piers self concept	1		SMD (Fixed, 95% CI)	Not estimable

Comparison 4

Mattejat 2001

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Patient outcomes at an average of 3 years and 8 months	1		SMD (Fixed, 95% CI)	Totals not selected
1.1 Marburg symptom score	1		SMD (Fixed, 95% CI)	Not estimable
1.2 Mannheim symptom score	1		SMD (Fixed, 95% CI)	Not estimable
1.3 Marburg adaptation score	1		SMD (Fixed, 95% CI)	Not estimable
1.4 Mannheim adaptation score	1		SMD (Fixed, 95% CI)	Not estimable

Comparison 5

Gowers 2007

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Resource use at 2 years	1		SMD (Fixed, 95% CI)	Totals not selected
1.1 Inpatient nights	1		SMD (Fixed, 95% CI)	Not estimable
1.2 Outpatient nights	1		SMD (Fixed, 95% CI)	Not estimable
1.3 Day unit contacts	1		SMD (Fixed, 95% CI)	Not estimable
1.4 Emergency room contacts	1		SMD (Fixed, 95% CI)	Not estimable
1.5 Overall costs per patient	1		SMD (Fixed, 95% CI)	Not estimable
1.6 Total costs	1		SMD (Fixed, 95% CI)	Not estimable

Comparison 6

Summary of published results

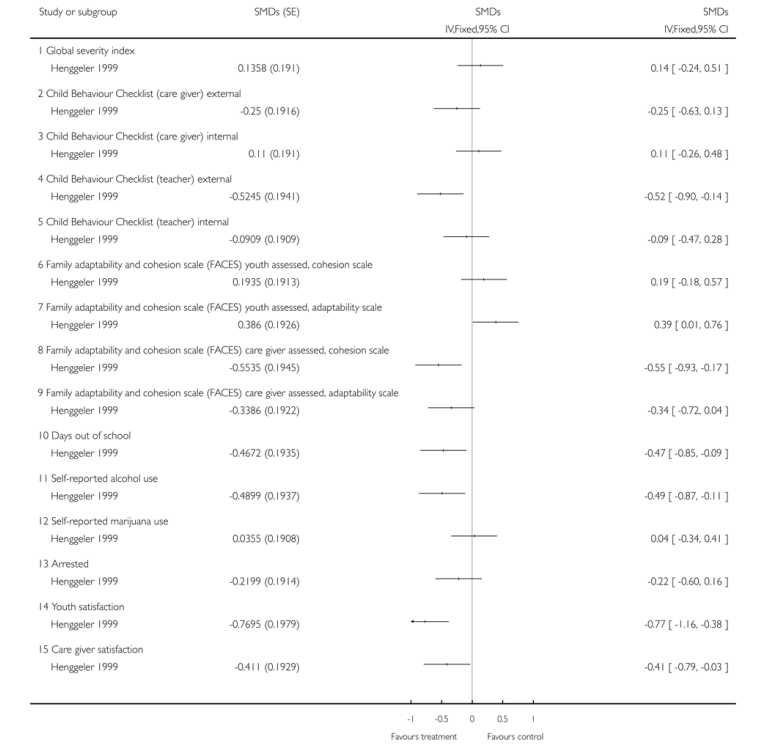
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Published results			Other data	No numeric data

Analysis 1.1. Comparison 1 Henggeler 1999 - multi-systemic therapy, Outcome 1 Patient assessed outcomes at 4 months Henggeler

Review: Alternatives to inpatient mental health care for children and young people

Comparison: 1 Henggeler 1999 - multi-systemic therapy

Outcome: 1 Patient assessed outcomes at 4 months Henggeler

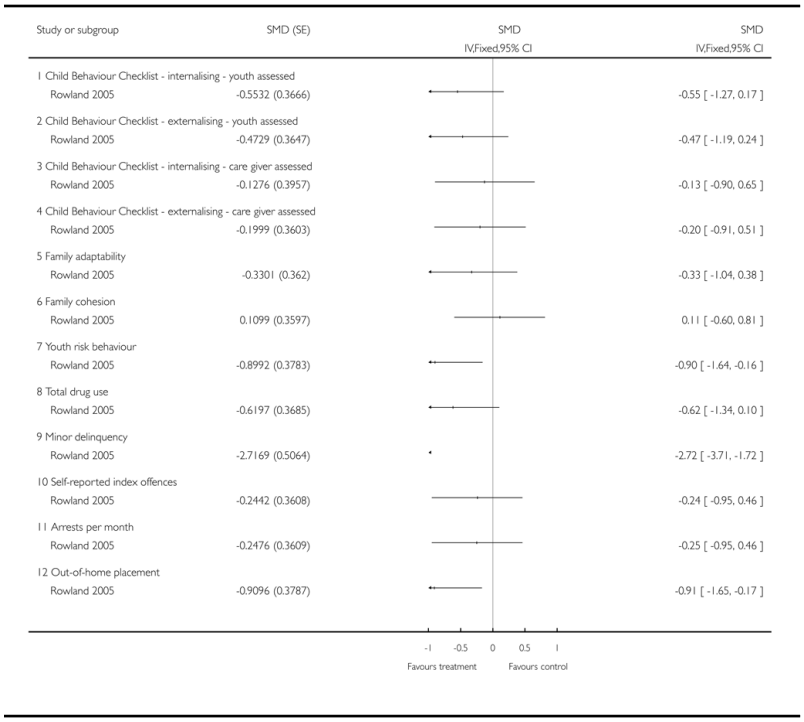


Analysis 2.1. Comparison 2 Rowland 2005 - multi-systemic therapy, Outcome 1 Patient outcomes at 6 months - Rowland

Review: Alternatives to inpatient mental health care for children and young people

Comparison: 2 Rowland 2005 - multi-systemic therapy

Outcome: 1 Patient outcomes at 6 months - Rowland

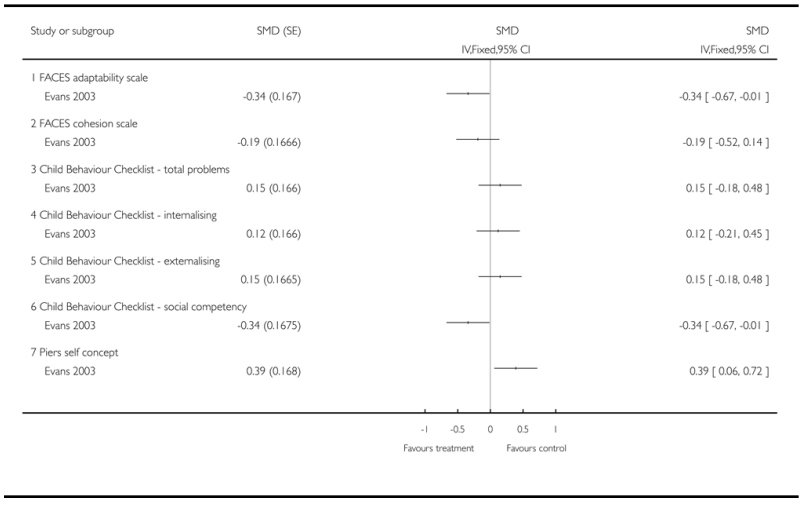


Analysis 3.1. Comparison 3 Evans 2003 - Family Preservation Services, Outcome 1 Patient outcomes at 6 months - Evans

Review: Alternatives to inpatient mental health care for children and young people

Comparison: 3 Evans 2003 - Family Preservation Services

Outcome: 1 Patient outcomes at 6 months - Evans

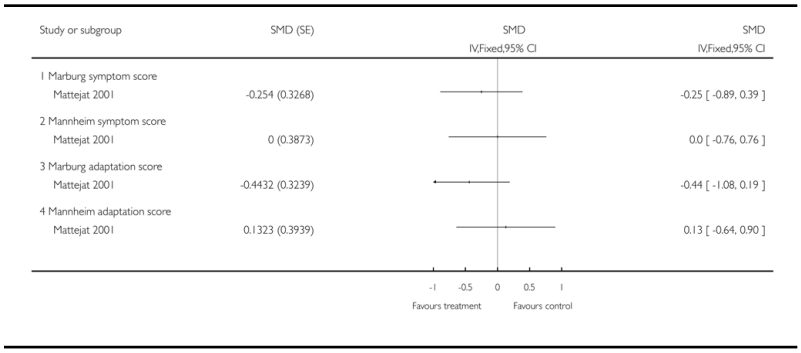


Analysis 4.1. Comparison 4 Mattejat 2001, Outcome 1 Patient outcomes at an average of 3 years and 8 months

Review: Alternatives to inpatient mental health care for children and young people

Comparison: 4 Mattejat 2001

Outcome: 1 Patient outcomes at an average of 3 years and 8 months

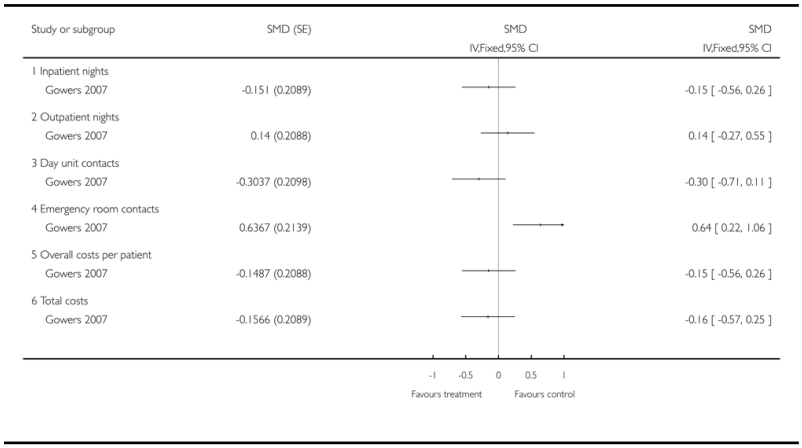


Analysis 5.1. Comparison 5 Gowers 2007, Outcome 1 Resource use at 2 years

Review: Alternatives to inpatient mental health care for children and young people

Comparison: 5 Gowers 2007

Outcome: 1 Resource use at 2 years



Analysis 6.1. Comparison 6 Summary of published results, Outcome 1 Published results

Published results

Study	Study details	Results	Notes
Evans 2003	Intervention: 'Homebuilders' vs 'Homebuilders'+ vs case management Study population: emotional/ behavioural disorders N = 296 Age ranges = 12.3 years (SD 3.6) Sample size 296 (after attrition, n = 238) HB = 90 HB+ = 85 CCM = 63 49 patients not accounted for Source: families accessed 'Home-builders' programmes by referral from local psychiatric or general hospitals providing psychiatric emergency services TIME FRAME OF STUDY Baseline Discharge at 4/6 weeks 6 months follow up Discharge attrition varied from test to test ranging from 15% on the Inventory of Socially Supported Behaviours to 26% on the Piers Harris Self Concept test. 6-month follow up attrition ranged from28%on the Inventory of Socially Supported Behaviours to 43% on the Piers Harris Self Concept test. Exact attrition per test is not reported. At follow up, attrition rates were approx. 33%, ranging from 28% on the ISSB to 43% on Piers Self Concept Psychometric Properties Piers Self Concept: 80-question test where higher scores = better self esteem FACES: 30-item scale where higher scores = poorer cohesion and adaptation Parental self-efficacy: 25-item self report measure with higher scores = better self-efficacy Socially Supported Behaviours: 40-item self-report scale where higher scores = better social support networks Child Behaviour Checklist: 118-item scale with higher scores = poorer cohesion and adaptability. Higher scores on the social competence scale indicate better social functioning. Child/Adolescent Functional Assessment Scale: Clinician rated youth role performance, thinking, behaviour towards others, moods/emotions and substance abuse. Total impairment score derived from 5 subscales with higher score indicating greater impairment	Hospitalisation during treatment: Placement at discharge: 75/90 HBCI (83%) in community 73/85HBCI+ (86%) in community 49/63 CCM (78.4%) in community Not significant Hospitalisation during intervention: 9/90 HBCI (10%) in community 9/85 HBCI+ (10.59%) in community 3/63 CCM (5.76%) in community Not significant Piers Self Concept: At baseline (mean): HB = 49.98 (SD 11.40) HB+ = 49.36 (SD 12.47) CCM = 46.61 (SD 12.43) At discharge (mean): HB = 52.69 (SD 11.00) HB+ = 51.71 (SD 9.26) CCM = 51.55 (SD 10.55) HB vs CCM Mean Difference: 1.44 (−2.37 to 4.65) HB+ vs CCM Mean Difference: 0.16 (−3.07 to 3.39) At follow up (mean): HB = 53.07 (SD 9.25) HB+ = 52.38 (SD 8.76) CCM = 53.14 (SD 9.32) HB vs CCM Mean Difference: −0.70 (−3.08 to 2.94) HB+ vs CCM Mean Difference: −0.76 (−3.72 to 2.20) No significant treatment effects between groups Family Adaptability & Cohesion Scales (FACES) Adaptability subscale: At baseline (mean): HB = 49.30 (SD 8.07) HB+ = 47.04 (SD 9.28) CCM = 47.59 (SD 6.65) At discharge (mean): HB = 51.53 (SD 7.38) HB+ = 51.86 (SD 7.48) CCM = 50.35 (SD 6.12) HB vs CCM Mean Difference: 1.18 (95% CI −1.06 to 3.42) HB+ vs CCM Mean Difference: 1.51 (95% CI −0.77 to 3.79) Not significant At follow up (mean): HB = 50.83 (SD 5.93) HB+ = 51.35 (SD 6.81) CCM = 49.56 (SD 7.07) HB vs CCM Mean Difference: 1.27 (95% CI −0.81 to 3.35) HB+ vs CCM Mean Difference:1.79 (95% CI −0.48 to 4.06) Not significant Cohesion subscale At baseline (mean): HB = 53.18 (SD 11.15) HB+ = 52.36 (SD 13.68) CCM = 53.66 (SD 11.31) At discharge (mean): HB = 55.76 (SD 9.56) HB+ = 56.41 (SD 10.39) CCM = 51.88 (SD 10.44) HB vs CCM Mean Difference: 3.88 (95% CI 0.657 to 7.10) HB+ vs CCM Mean Difference: 4.53 (95% CI 1.11 to 7.95)	Piers Self Concept: 80-question test where higher scores = better self esteem FACES: 30-item scale where higher scores = more cohesion and adaptation Parental self-efficacy: 25-item self report measure with higher scores = better self-efficacy Socially Supported Behaviours: 40-item self-report scale where higher scores = better social support networks Child Behaviour Checklist: 118-item scale with higher scores = poorer cohesion and adaptability. Higher scores on the social competence scale indicate better social functioning. Child/Adolescent Functional Assessment Scale: clinician-rated youth role performance, behaviour towards others, moods/ emotions, substance abuse. Total score derived from 5 subscales with higher score indicating greater impairment

Study	Study details	Results	Notes
		Not significant At follow up (mean): HB = 53.97 (SD 7.94) HB+ = 53.33 (SD 8.68) CCM = 53.00 (SD 7.96) HB vs CCM Mean Difference: 0.97 (95% CI −1.61 to 3.55) HB+ vs CCM Mean Difference: 0.33 (95% CI −2.42 to 3.08) Significant treatment effect favouring HBCI (vs CCM) P < 0.05 Significant treatment effect favouring HBCI+ (vs CCM) P < 0.01 Parental self-efficacy At baseline (mean): HB = 77.17 (SD 10.49) HB+ = 76.58 (SD 11.96) CCM = 75.56 (SD 11.46) At discharge (mean): HB = 79.95 (SD 11.27) HB+ = 78.64 (SD 12.07) CCM = 76.79 (SD 13.20) HB vs CCM Mean Difference: 3.16 (95% CI −0.77 to 7.09) HB+ vs CCM Mean Difference: 1.85 (95% CI −2.28 to 5.98) Not significant At follow up (mean): HB = 79.56 (SD 10.10) HB+ = 81.85 (SD 11.44) CCM = 79.44 (SD 14.22) HB vs CCM Mean Difference: 0.12 (95% CI −3.76 to 4.00) HB+ vs CCM Mean Difference: 2.41 (9%% CI −1.76 to 6.58) Not significant Socially Supported Behaviours At baseline (mean): HB = 88.76 (SD 30.10) HB+ = 77.89 (SD 29.19) CCM = 84.72 (SD 26.75) At discharge (mean): HB = 91.60 (SD 32.12) HB+ = 86.00 (SD 30.70) CCM = 80.95 (SD 30.82) HB vs CCM Mean Difference: 10.7 (95% CI .40 to 20.9) HB+ vs CCM Mean Difference: 5.05 (95% CI −5.05 to 15.2) Not significant At follow up (mean): HB = 76.26 (SD 23.89) HB+ = 75.83 (SD 27.53) CCM = 73.65 (SD 27.88) HB vs CCM Mean Difference: 2.61 (95% CI −5.70 to 10.9) HB+ vs CCM Mean Difference: 2.18 (95% CI −6.91 to 11.3) Significant treatment effect favouring HBCI+ (vs CCM) P < 0.05 Child Behaviour Checklist (Total Problems) At baseline (mean): HB = 69.83 (SD 8.59) HB+ = 68.37 (SD 10.66) CCM = 72.98 (SD 8.91) At discharge (mean): HB = 72.02 (SD 6.68) HB+ = 70.67 (SD 9.63) CCM = 71.56 (SD 9.50) HB vs CCM Mean Difference: 0.46 (95% CI −2.12 to 3.04) HB+ vs CCM Mean Difference: −0.89 (95% CI −4.04 to 2.26)	

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Study	Study details	Results	Notes
		Not significant At follow up (mean): HB = 68.16 (SD 10.04) HB+ = 66.92 (SD 9.08) CCM = 70.06 (SD 10.50) HB vs CCM Mean Difference: −1.90 (95% CI −5.22 to 1.42) HB+ vs CCM Mean Difference: −3.14 (95% CI −6.33 to 0.05) Significant treatment effect favouring HBCI (vs CCM) P < 0.05 Significant treatment effect favouring HBCI+ (vs CCM) P < 0.05 Child Behaviour Checklist (Internalising) At baseline (mean): HB = 66.82 (SD 8.05) HB+ = 65.84 (SD 10.80) CCM = 69.16 (SD 11.03) At discharge (mean): HB = 68.30 (SD 7.41) HB+ = 67.85 (SD 10.07) CCM = 66.49 (SD 10.51) HB vs CCM Mean Difference: 1.81 (95% CI −1.05 to 4.67) HB+ vs CCM Mean Difference: 1.36 (95% CI −2.01 to 4.73) Not significant At follow up (mean): HB = 63.92 (SD 9.72) HB+ = 63.50 (SD 9.10) CCM = 65.65 (SD 10.80) HB vs CCM Mean Difference: −1.73 (95% CI −5.03 to 1.57) HB+ vs CCM Mean Difference: −2.15 (95% CI −5.39 to 1.09) Significant treatment effect favouring HBCI+ (vs CCM) P < 0.05 Child Behaviour Checklist (Externalising) At baseline (mean): HB = 68.58 (SD 10.14) HB+ = 66.73 (SD 12.13) CCM = 71.22 (SD 9.87) At discharge (mean): HB = 70.17 (SD 8.02) HB+ = 67.93 (SD 10.12) CCM = 71.02 (SD 9.00) HB vs CCM Mean Difference: −0.85 (95% CI −3.59 to 1.89) HB+ vs CCM Mean Difference: −3.09 (95% CI −6.26 to 0.08) Not significant At follow up (mean): HB = 67.38 (SD 9.89) HB+ = 65.50 (SD 9.86) CCM = 68.42 (SD 11.44) HB vs CCM Mean Difference: −1.04 (95% CI −4.47 to 2.39) HB+ vs CCM Mean Difference: −2.92 (95% CI −6.39 to 0.55) Not significant Child Behaviour Checklist (Social Competency) At baseline (mean): HB = 32.44 (SD 5.99) HB+ = 31.63 (SD 6.99) CCM = 33.29 (SD 7.90) At discharge (mean): HB = 33.00 (SD 7.58) HB+ = 32.97 (SD 6.64) CCM = 33.74 (SD 7.52) HB vs CCM Mean Difference: −0.74 (95% −3.19 to 1.71)	

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Study	Study details	Results	Notes
		HB+ vs CCM Mean Difference: −0.77 (95% CI −3.08 to 1.54) Not significant At follow up (mean): HB = 33.47 (SD 6.67) HB+ = 33.17 (SD 4.93) CCM = 32.96 (6.03) HB vs CCM Mean Difference: 0.51 (95% CI −1.57 to 2.59) HB+ vs CCM Mean Difference: 0.21 (95% CI −1.57 to 1.99) Not significant Child/Adolescent Functional Assessment Scale At baseline (mean): HB = 66.56 (SD 40.17) HB+ = 72.17 (SD 32.98) CCM = 65.15 (SD 25.43) (data not reported in study on discharge or follow-up measures)	
Gowers 2007	Intervention: specialist outpatient care vs inpatient care vs generic out-patient care Study population: anorexia nervosa N = 167 Age ranges = 12 to 18 years Source: recruited from 38 CAMHS teams across NE England TIME FRAME OF STUDY Baseline 1-year follow up 2-year follow up At 2-year follow up, data were available on 81% of the original sample (135/167) for cost effectiveness analysis	N = 167 (inpatient care n = 57 (I), specialist outpatients n = 55 (SI) and generic outpatient treatment n = 55 (GO) Use of resources during the 2-year follow-up period (inpatient n = 47, specialist outpatient n = 45, general outpatient n = 43): Inpatient nights (mean) I = 73 (SD 124) SI = 55 (SD 114) GO = 89 (SD 159) Mean Differences I vs SO = 18 (95% CI 31.4 to 67.4) SO vs GO = −34 (95% CI −92.4 to 24.4) Outpatient appointments (mean) I = 23 (SD 20) SO = 26 (SD 22) GO = 31 (SD 24) Mean Differences I vs SO = −3.00 (95% CI −11.3 to 5.27) SOvs GO = −5.00 (95%CI −14.7 to 4.75) Day patient contacts (mean) I = 4 (SD 14) SO = 1 (SD 7) GO = 0 (SD 1) Mean Differences I vs SO = 3.00 (95% CI −1.62 to 7.62) SO vs GO = 1.00 (95% CI −1.14 to 3.14) Accident & Emergency contacts (mean) I = 0 (SD = 1) SO = 1 (SD = 2) GO = 0 (SD = 1) Clinical Outcomes: Body Mass Index Baseline, mean (SD) Specialised outpatient 15.3 (1.6) N = 55 Inpatienta15.3 (1.6) N = 57 At 1 year, mean (SD) Specialised outpatient 17.9 (2.2) N = 52 Inpatient 17.5 (2.2) N = 52 At 2 years, mean (SD) Specialised outpatient 18.7 (2.1) N = 50	Eating Disorder Index covers 12 domains of eating cognitions, behaviours and social functioning Family assessment device assesses family function, contains 7 subscales with lower score indicating improvement Morgan-Russell Average Outcome Scale provides a score from 0 to 12 based on a mean of 5 subscales covering nutritional status, menstruation, mental state, psychosexual adjustment and socioeconomic status. Lower scores indicate improvement HoNOSCA, self-rated, lower score indicates greater improvement

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Study	Study details	Results	Notes
		Inpatient 18.7 (2.8) N = 52 Eating Disorder Index Baseline, mean (SD) Specialised outpatient 86.5 (47.5) N = 54 Inpatient 89.6 (44.5) N = 56 At 1 year, mean (SD) Specialised outpatient 57.6 (54) N = 44 Inpatient 60.6 (52.9) N = 43 At 2 years, mean (SD) Specialised outpatient 52.5 (49.1) N = 42 Inpatient 40.3 (36.4) N = 43 Family assessment device Baseline, mean (SD) Specialised outpatient 2.12 (0.53) N = 54 Inpatient 2.08 (0.5) N= 56 At 1 year, mean (SD) Specialised outpatient 2.08 (0.55) N = 45 Inpatient 1.95 (0.5) N = 43 At 2 years, mean (SD) Specialised outpatient 1.99 (0.59) N = 39 Inpatient 1.99 (0.5) N = 42 Morgan-Russell Average Outcome Scale Baseline, mean (SD) Specialised outpatient 30.1 (14.7) N = 54 Inpatient 32.6 (14.6) N = 56 At 1 year, mean (SD) Specialised outpatient 19.3 (16.7) N = 46 Inpatient 18.2 (15.6) N = 43 At 2 years, mean (SD) Specialised outpatient 17.1 (15.1) N = 42 Inpatient 15.8 (14.5) N = 42 HoNOSCA, clinician-rated Baseline, mean (SD) Specialised outpatient 20.7 (7.5) N = 55 Inpatient 20.0 (5.6) N = 57 At 1 year, mean (SD) Specialised outpatient 16.8 (9.7) N = 49 Inpatient 14.2 (7.4) N = 52 At 2 years, mean (SD) Specialised outpatient 13.7 (8.9) N = 51 Inpatient 14.3 (9.1) N = 52 HoNOSCA, self-rated Baseline, mean (SD) Specialised outpatient 17.4 (9.9) N = 53 Inpatient 15.6 (9.5) N = 53 At 1 year, mean (SD)	

Study	Study details	Results	Notes
		Specialised outpatient 11.7 (9.0) N = 44 Inpatient 8.6 (8.2) N = 42 At 2 years, mean (SD) Specialised outpatient 8.9 (8.1) N = 43 Inpatient 7.7 (8.6) N = 43 Average outcome scale (mean of 5 scales assessing food intake, menstruation, mental state, psychosexual functioning and socioeconomic status) Baseline, mean (SD) Specialised outpatient 4.6 (1.5) N = 55 Inpatient 5.1 (1.5) N = 57 At 1 year, mean (SD) Specialised outpatient 7.3 (2.3) N = 52 Inpatient 7.5 (2.4) N = 52 At 2 years, mean (SD) Specialised outpatient 8.4 (2.4) N = 51 Inpatient 8.3 (2.6) N = 52	
Henggeler 1999	Intervention: multi-systemic therapy at home vs inpatient hospital care Study population: psychosis/ suicide N = 113 (57 MST, 56 Control) Age ranges = mean 13 years Source: patients were recruited from the Medical University of South Carolina TIME FRAME OF STUDY Baseline = 24 hrs of consent for trial Control Youth left hospital = 1 to 2 weeks after baseline MST Treatment Youth discharge = mean 123 days/4 months after T1 After initial drop out, complete data collection was obtained from T1 to T3 Psychometric properties Global Severity Index of Brief Symptoms: higher scores = greater emotional distress Child Behaviour Checklist: higher scores = greater externalising/internalising behaviour. Higher scores on social competence scale indicate better social functioning Personal Experiences Inventory (drug abuse): higher scores = greater drug involvement FACES: higher scores = less cohesion/adaptability within family Family Friends Scale: higher scores = lower social support Youth & Caregiver satisfaction: higher scores = greater satisfaction	Youth functioning: All tests MST n = 57 (T), Control n = 56 (C) (56/57 MST retained and Controls retained 53/56 Global Severity Index of Brief Symptoms At baseline (mean): T = 1.01 (SD 0.7), C = 1.22 (SD 0.8) When control left hospital (mean): T = 0.71 (SD 0.6), C = 1.03 (SD 0.9) Mean Difference −0.320 (CI 95% −0.609 to −0.0310) When treatment group completed treatment (mean): T = 0.74 (SD 0.9), C = 0.84 (SD 0. 7) Mean Difference −0.10 (CI 95% −0. 407 to 0.207) Significant effect for TIME only (P < 0.017) Child Behaviour Checklist (care giver): Externalising Behaviour At baseline (mean): T = 73.3 (SD 10.3), C = 70.6 (12.3) When C left hospital (mean): T = 67.4 (SD 12.1), C = 62.4 (SD 12.2) Mean Difference 5.00 (CI 95% 0. 405 to 9.59) When treatment group completed treatment (mean): T = 63.7 (SD 12.4), C = 64.3 (SD 14.2) Mean Difference −0.60 (CI 95% −5. 65 to 4.45) Significant effect favouring MST (P < 0.011) Internalising Behaviour At baseline (mean): T = 68 (SD 10.9), C = 69.5 (SD 10. 9)	Global Severity Index of Brief Symptoms: higher scores = greater emotional distress Child Behaviour Checklist: higher scores = greater externalising/ internalising behaviour. Higher scores on social competence scale indicate better social functioning Personal Experiences Inventory (Drug abuse): higher scores = greater drug involvement FACES: higher scores = more cohesion/ adaptability within family Family Friends Scale: higher scores = lower social support Youth & Caregiver satisfaction: higher scores = greater satisfaction Family Functioning Self Esteem Scale: higher scores in conventional involvement and antisocial friends subscales = better functioning MST = 57/57, Control = 53/56 had measures collected at baseline, 1 to 2 weeks later and then at 4 months

Study	Study details	Results	Notes
		When control group left hospital (mean): T = 62.1 (SD 12.6), C = 63.1 (SD 10.5) Mean Difference −1.00 (CI 95% −5.42 to 3.42) When treatment group completed treatment (mean): T = 60.6 (SD 12.8), C = 60.7 (SD 12.6) Difference −1.00 (CI 95% −4.93 to 4.73) Significant effect for TIME only (P < 0.017) Child Behaviour Checklist (teacher) : Externalising At baseline (mean): T = 71.1 (SD 10.7) C = 67.8 (SD 15.1) When treatment group completed treatment (mean): T = 64.8 (SD 11.8) C = 68 (SD 13) Mean Difference −3.20 (95% CI −7.91 to 1.51) Significant effect favouring MST (P < 0.048) Internalising At baseline (mean): T = 64.6 (SD 12.2) C = 62.2 (SD 13.9) When treatment group completed treatment (mean): T = 60.1 (SD 12.8) C = 58.8 (SD 11.3) Mean Difference 1.30 (95% CI −3.29 to 5.89) Significant effect for TIME only (P < 0.017) Personal Experiences Inventory (drug abuse): Alcohol in past 3 months At baseline (mean): T = 2.48 (7.3) C = 0.77 (2.5) When treatment group completed treatment (mean): T = 1.27 (3.2), C = 1.20 (3.5) Mean Difference 0.07 (95% CI −1.20 to 1.34) Not significant Marijuana in past 3 months At baseline (mean): T = 4.63 (14.3), C = 3.61 (14.3) When treatment group completed treatment (mean): T = 3.86 (14.4), C = 2.39 (10.5) Mean Difference 1.47 (95% CI −3.34 to 6.28) Not significant Arrest At baseline (mean): T = 0.46 (0.5), C = 0.30 (0.5) When treatment group completed treatment (mean): T = 0.33 (0.5), C = 0.27 (0.4) Mean Difference 0.060 (95% CI −.113 to .233) Not significant Family Functioning Self Esteem At baseline (mean): T = 2.57 (0.9), C = 2.21 (1.0) When treatment group completed treatment (mean):	

Study	Study details	Results	Notes
		T = 2.55 (1.1) C = 2.73 (0.9) Mean Difference −0.180 (95% CI −0.563 to −0.203) Significant effect favouring INPATIENT group (P < 0.039) Global Severity Index of Brief Symptoms (care giver) At baseline (mean): T = 0.52 (0.5) C = 0.71 (0.8) When C left hospital (mean): T = 0.46 (0.5) C = 0.60 (0.7) Mean Difference −0.140 (95% CI −0.370 to −0.090) When treatment group completed treatment (mean): T = 0.46 (0.5) C = 0.57 (0.7) Mean Difference −110 (95% CI −0. 340 to 0.120) Significant effect for TIME only (P < 0.017) Family Adaptability and Cohesion Evaluation Scales (youth Cohesion subscale At baseline (mean): T = 29.6 (9.7) C = 29.7 (9.5) When C left hospital (mean): T = 26.5 (10.4) C = 30.6 (8.9) Mean Difference −4.10 (95% CI −7.79 to −0.415) When treatment group completed treatment (mean): T = 29.7 (9.3) C = 31.6 (9.3) Mean Difference −0.19 (95% CI −5.43 to 1.63) Not significant Adaptability subscale At baseline (mean): T = 23.1 (6.7) C = 22.1 (6.7) When control group left hospital (mean): T = 21.5 (7.4) C = 24.9 (7.5) Mean Difference −3.40 (95% CI −6. 23 to −0.570) When treatment group completed treatment (mean): T = 21.8 (8.1) C = 23.8 (7.4) Mean Difference −2.00 (95% CI −4. 95 to .951) Significant effect favouring MST (P < 0.039) Family Adaptability and Cohesion Evaluation Scales (caregiver) Cohesion subscale At baseline (mean): T = 32.2 (8.4) C = 36.1 (5.3) When C left hospital (mean): T = 32 (7.1) C = 36.3 (6.4) Mean Difference −4.30 (95% CI −6. 87 to −1.73) Significant effect favouring MST (P < 0.001)	

Study	Study details	Results	Notes
		When treatment group completed treatment (mean): T = 34.4 (6.6) C = 34.7 (6.4) Mean Difference −0.300 (95% CI −2.77 to 2.17) Significant effect favouring MST (P < 0.004) Adaptability subscale At baseline (mean): T = 23.9 (5.7) C = 25 (5.2) When C left hospital (mean): T = 23.2 (5.1) C = 22.4 (5.7) Mean Difference 0.800 (95% −1.25 to 2.85) When treatment group completed treatment (mean): T = 23 (5.3) C = 22.4 (4.7) Mean Difference 0.600 (95% −1.31 to 2.51) Significant effect for TIME only (P < 0.017) Child Behaviour Checklist - Social (care giver) At baseline (mean): T = 30.2 (6.1) C = 30.9 (6.3) When C left hospital (mean): When treatment group completed treatment (mean): T = 33.5 (6.8) C = 31.8 (6.9) Mean Difference 1.70 (CI 95% −0.902 to 4.30) Significant effect for TIME only (P < 0.017) Child Behaviour Checklist - Social (youth) At baseline (mean): T = 34.9 (6.1) C = 36.6 (8.5) When treatment group completed treatment (mean): T = 36.3 (7.9) C = 38.7 (8.6) Difference −2.40 (CI 95% −5.53 to 0.733) Not significant between baseline & MST completed treatment Family Friends Scale Conventional involvement At baseline (mean): T = 1.97 (0.8) C = 1.95 (0.8) When treatment group completed treatment (mean): T = 1.89 (0.7) C = 2.09 (0.8) Mean Difference −0.200 (CI 95% −0.485 to 0.0850) Not significant between baseline and MST completed treatment Antisocial friends At baseline (mean): T = 0.99 (0.8) C = 1.07 (0.9) When treatment group completed treatment (mean): T = 1.09 (1.0) C = 1.05 (0.9)	

Study	Study details	Results	Notes
		Mean Difference 0.040 (95% CI −0.32 to 0.40) Not significant When treatment group completed treatment (mean): T = 14 days (SD 36.8) C = 37 days (SD 59.8) Mean Difference −23 (95% CI −41.7 to 4.26) Significant effect favouring MST (P < 0.018) Youth consumer satisfaction When control group left hospital (mean): T = 15.7 (4.4) C = 13.3 (4.2) Mean Difference 2.40 (95% CI 0.765 to 4.04) When treatment group completed treatment (mean): T = 15.5 (4.5) C = 12 (4.6) Mean Difference 3.50 (95%CI 1.77 to 5.23) Significant effect favouring MST (P < 0.007) Care giver consumer satisfaction When control group left hospital (mean): T = 17.6 (3.2) C = 16.5 (3.4) Mean Difference 1.10 (95% CI −0.153 to 2.35) When treatment group completed treatment (mean): T = 17.9 (3.4) C = 16.4 (3.9) Mean Difference 1.50 (95% 0.113 to 2.89) Significant effect favouring MST (P < 0.044) Hospitalised at least once between baseline and 4-month follow up: T = 25/57 (44%) C = 53/53 (100%) hospitalised at baseline) After release from hospital, 11/56 C (20%) were rehospitalised at least once between discharge and 4-month follow up Difference 24% (95% CI 8% to 41%) N = 113 Between baseline and control discharge 1/2 weeks later: Any hospitalisation of youth: T = 14/57 (24.6%), C = 56/56 (100%) Mean Difference = −75.4% (95% CI −86.6% to −64.3%) Significance P < 0.001 Mean days hospitalised: T = 0.54 (1.81), C = 5.77 (3.50) Mean Difference −5.23 (CI 95% −6.27 to −4.19) Significance P = 0.001 Mean days per hospitalised youth (n = 70): T = 2.21 (1.42), C = 5.77 (3.50) Mean Difference −3.56 (CI 95% −5.47 to −1.65) Significance P = 0.001 Mean length of stay per hospital episode (n = 70): T = 2.14 (1.46), C = 5.49 (2.63)	

Study	Study details	Results	Notes
		Mean Difference −3.35 (95% CI −4.81 to −1.89) Significance P = 0.001 From control discharge until treatment group 4-month follow up: Any hospitalisation of youth: T = 16/57 (28%), C = 11/57 (20%) Mean Difference 8.8% (95% CI −6.75% to 24.30%) Significance: P > 0.05 Mean total days hospitalised by T group from baseline to 4-month follow up: T = 25/57 (44%), C = 56/56 (100%) Mean Difference 56.1% (95% CI −6.90 to 43.3%) Significance: P < 0.001 N = 115 Medicaid recipients Mean treatment costs to Medicaid: From baseline to 4-month follow up (T group discharge): T (n = 61) = $8236 (SD $6890) C (n = 54) = $11725 (SD $5065) Mean Difference −$3489 (95% CI −$5748 to −$1230) Significance P = 0.004 From T group discharge at 4 months until 12-month follow up: T (n = 53) = $11709 (SD $13396) C (n = 49) = $13451 (SD $16351) Mean Difference −$1742 (95% CI −$7596 to $4112) Not significant P = 0.556 *This analysis does not include the $10276 of MST expenses not billed to Medicaid as they came from a research grant. Top 5 outliers were removed from each dataset to calculate means	
Mattejat 2001	Study population: emotional & behavioural disorders N = 68 Age ranges = mean 15.6 months (SD 3 years 3 months) at follow up. Mean at start of treatment was 11 years 9 months Source: 2 child/adolescent psychiatry hospitals in Mannheim & Marburg, Germany TIME FRAME OF STUDY Baseline Discharge (time frame uncertain) Follow up = 2 to 5 years later (mean 3 years 8 months) Psychometric Properties Number of Marked Symptoms: range of scores from 0 (no symptoms) to 22 (maximum symptoms) Adaptation to school or work: range of scores from 1 = excellent to 7 = extremely impaired	N = 27 (Mannheim) N = 41 (Marburg) I = Inpatient, H = Home Treatment Marburg sample Number of Marked Symptoms: At baseline (mean symptoms): I (n = 18) = 2.2 (SD 1.5) H (n = 23) = 1.9 (SD 1.1) At discharge (mean symptoms): I (n = 18) = 0.8 (SD 1.1) H (n = 23) = 0.2 (SD 0.5) Mean Difference 0.60 (95% CI 0. 0796 to 1.12) At follow up (mean symptoms): I (n = 16) = 0.8 (SD 1.0) H (n = 23) = 0.3 (SD 0.6) Mean Difference 0.50 (95% CI −0. 0191 to 1.02) There were no significant differences between groups at any time (Marburg inpatient/home treatment) Mannheim sample Number of Marked Symptoms: At baseline (mean symptoms): I (n = 15) = 3.8 (SD 1.7) H (n = 12) = 3.3 (SD 1.2) At discharge (mean symptoms): I (n = 15) = 0.9 (SD 1.6) H (n = 12) = 0.3 (SD 0.5) Difference 0.06 (95% CI −0.391 to 1.59) At follow up (mean symptoms): I (n = 15) = 2.0 (SD 1.4) H (n = 12) = 1.5 (SD 1.7)	Number of Marked Symptoms: range of scores from 0 (no symptoms) to 22 (maximum symptoms) Adaptation to school or work: range of scores from 1 = excellent to 7 = extremely impaired

Study	Study details	Results	Notes
		Difference 0.50 (95% CI −0.728 to 1.73) There were no significant differences between groups at any time (Mannheim inpatient/home treatment) Marburg sample adaptation to school or work: Baseline (mean): I (n = 18) = 4.1 (SD 1.6) H (n = 23) = 3.7 (SD 1.2) At discharge: I (n = 18) = 3.6 (SD 1.4) H (n = 23) = 3.1 (SD 0.8) Difference 0.50 (95% CI −.20 to 1. 20) At follow up: I (n = 17) = 4.0 (SD 1.2) H (n = 23) = 3.2 (SD 0.6) Difference 0.80 (95% 0.22 to 1.40) There were no significant differences between groups at any time (Marburg inpatient/home treatment) Mannheim sample adaptation to school or work: At baseline: I (n = 15) = 4.4 (SD 1.2) H (n = 12) = 3.9 (SD 1.3) At discharge: I (n = 15) = 3.3 (SD 1.0) H (n = 12) = 2.6 (SD 1.0) Difference 0.70 (95% −0.098 to 1.5) At follow up: I (n = 14) = 3.5 (SD 1.6) H (n = 12) = 3.2 (SD 1.4) Difference 0.30 (95% CI −.93 to 1.53) There were no significant differences between groups at any time (Mannheim inpatient/home treatment)	
Rowland 2005	Intervention: multi-systemic therapy delivered at home or outpatients vs community services co-ordinated by case managers; could include individual and family therapy, intensive home services, medication management, therapeutic foster care, group home treatment, day treatment, therapeutic aide services, and hospital based residential treatment Study population: emotional/ behavioural disorders N = 55 (MST = 26, Control = 29) Age ranges = 9 to 17 years (mean 14.5 years) Source: Child/Adolescent Mental Health Department Co-ordinators who manage care for all youth with intensive mental health needs contacted research staff whenever a youth was eligible for out-of-home placement. Recruitment staff then contacted the families to obtain consent TIME FRAME OF STUDY Baseline 6-month follow up	At 6-month follow up, MST n = 15, Control n = 16 (data reported for these 31 youth only) Child Behaviour Checklist (externalising - care giver): Baseline (mean): T = 71.53 (SD 13.06) C = 67.9 (SD 9.4) 6-month follow up (mean): T = 65.93 (SD 15.14) C = 64.6 (SD 6.48) Mean Difference 1.33 (95% CI −7. 13 to 9.79) No significant between group differences No significant time differences Child Behaviour Checklist (internalising - care giver): Baseline (mean): T = 68 (SD 14.31) C = 65 (SD 15.55) 6-month follow up (mean): T = 62.73 (SD 14.21) C = 61.53 (SD 14) Mean Difference 1.20 (95% CI −9.17 to 11.6) No significant between groups differences No significant time differences Child Behaviour Checklist (externalising - youth): Baseline (mean):	Outcome measurement scales: Child Behaviour Checklist: higher scores = poorer cohesion and adaptability. 3-point scale with 118 items and 20 items measuring social competency Youth Risk Behaviour Survey: 8-item scale assessing interpersonal and self-inflicted violence. Higher scores = more dangerousness Personal Experiences Inventory (drug abuse) : 12-item scale of self-reported sum of substance abuse over past 90 days. Higher score = more substance abuse Self-report delinquency scale: 40-item self-report of minor and major offences over 3 months. Higher scores = greater delinquency FACES: higher scores = more cohesion/

Study	Study details	Results	Notes
	Baseline differences between groups in terms of total self-reported drug use (MST heavier users), minor delinquency and index delinquency Authors state poor MST treatment fidelity Psychometric Properties Child Behaviour Checklist: higher scores = poorer cohesion and adaptability Youth Risk Behaviour Survey: 8-item scale assessing interpersonal and self-inflicted violence. Higher scores = more dangerousness Personal Experiences Inventory (drug abuse) : 12-item scale of self-reported sum of substance abuse over past 90 days Self-report delinquency scale: 40-item self-report minor and major offences over 3 months. Higher scores = greater delinquency FACES: higher scores = less cohesion/adaptability in family functioning Social support questionnaire: parent self-report satisfaction with available social support from 1 = 'dissatisfied' to 6 = 'very satisfied'	T = 66.8 (SD 12.74) C = 63.36 (SD 10.93) 6-month follow up (mean): T = 60.53 (SD 13.58)	adaptability in family functioning Social support questionnaire: parent self-report satisfaction with available social support from 1 = 'dissatisfied' to 6 = 'very satisfied'). Total satisfaction is a sum of scores on 6 items
Silberstein 1968	Intervention: parental counselling + child medication (4 combinations from counselling + drugs to placebo drugs only) Study population: emotional and behavioural disorders N = 48 Age ranges = mean 10 years 4months (range 4 years 2 months to 17 years) Source: Staten Island Mental Health Centre referred children meeting inclusion criteria for study TIME FRAME Baseline Discharge 26 weeks later (all groups) Psychometric Properties	At baseline n = 48, Group 1 n = 12, Group 2 n = 12, Group 3 n = 14 & Group 4 n = 10 Not hospitalised during study period: Group 1 (active drug + parent counselling) = 11/12 Group 2 (placebo counselling) = 11/12 Group 3 (active drug + no counselling)= 14/14 Group 4 (placebo drug + no counselling)= 10/10 Overall 46/48 children in study were not hospitalised Pooled treatment groups 1 to 3 (36/38) vs control (no treatment) Mean Difference −5% (95% CI −12.4% to 1.8%) Child did not provoke requests for hospitalisation: Group 1 = 11/12 Group 2 = 11/12 Group 3 = 13/14 Group 4 = 10/10 Overall 45/48 children in the study did not have hospital requests made by parents Pooled treatment groups 1 to 3 (35/38) vs control (no treatment) Mean Difference −7.9% (95% CI −16.5% to 0.6%) Did not get into police difficulties: Group 1 = 9/12 Group 2 = 10/12 Group 3 = 14/14 Group 4 = 10/10 Overall 43/48 children in the study did not get into trouble with police Pooled treatment groups 1 to 3 (33/38) vs control (no treatment)	

Study	Study details	Results	Notes
		Mean Difference −13.2% (95% CI −23.4% to −2.4%) Child remained in their regular classroom: Group 1 = 8/12 Group 2 = 9/12 Group 3 = 11/14 Group 4 = 8/10 Overall 36/48 children in the study remained in classroom Pooled treatment groups 1 to 3 (28/38) vs control (no treatment) difference −6.3% (95% CI −34.8% to 22.2%) Community adjustment: 16/48 children were unsuccessful/ partially successful in their community adjustment according to the authors 46/48 children were retained in community over 26 weeks 22 parent requests for hospitalisation related to 16 children No statistically significant findings on any measures TIME FRAME Baseline Discharge 26 weeks later (all groups)	
Winsberg 1980	Intervention: home care vs inpatient care Study population: emotional and behavioural disorders N = 49 Age ranges = 5 year 3 months to 13 years 2 months Source: an inpatient unit (Kings County Hospital ward) where all the children were inpatients while under assessment Baseline 6 months follow up Long-term follow up = 1.5 to 3 years Standardised testing during study cannot be used as different raters assessed treatment vs control group Psychometric properties No reliable psychometric tests were used in this study	N = 49 (Hospital (H Group) = 24, Community (C Group) = 25) Long-term follow up (1.5 to 3 years after treatment completed): Placement outcomes: 11/24 H group were in an institution (mostly residential school) 7/25 C group were in an institution (mostly residential school) 12/24 H group lived at home (1 died from a gunshot wound at home) 18/25 C group lived at home Institution Mean Difference = 17. 8% (95% CI −8% to 44%) Parent Final Impressions test of satisfaction: 20/25 C group parents were satisfied 17/24 H group parents were satisfied 4/25 C group parents were dissatisfied 6/24 H group parents were dissatisfied Satisfied Mean Difference = 9.17% (CI 95% 14.8% to 33.2%) The proportion of satisfied to dissatisfied parents did not vary between groups (P = ns)	

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* *Indicates the major publication for the study*

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PLAIN LANGUAGE SUMMARY

Health care services instead of admission to hospital for young people or children with mental health problems

Many countries place emphasis on providing mental health services in the least restrictive setting, recognizing that some children will need to be admitted to hospital. As a result there are a range of mental health services to manage young people with serious mental health problems in community or outpatient settings who are at risk of being admitted to hospital.

This review found seven studies which evaluated whether these other services helped children and young people with mental health problems. This review did not find any studies about intensive day treatment (where children attend treatment programmes during the day for a short period of time), intensive case management (health care professionals coordinate services and support for the children), therapeutic foster care (children live with specially trained foster parents) or residential care with inpatient care (children live in a residence, but not a hospital, which provides mental health care services).

The studies evaluated four different types of services. In **Multisystemic therapy (MST) at home**, therapists provide therapy to the child and the family together in their home. Some behaviours in the children, improved with MST. They also spent fewer days out of school and in hospital. **Intensive home treatment** provides children with therapy in their home to solve problems with the way they interact with other people in the home and to improve their psychological symptoms. Children who received this type of service did not improve any more than children who did not. **Intensive home based crisis intervention** (Homebuilders model for crisis intervention), focuses on the child and family to learn skills in relationship building, reframing problems, anger management, communication, and cognitive behavioural therapy. Children with this service had small improvements. **Specialist outpatient services** are provided by a range of health care professionals in clinics. Children who received this service did not improve any more than children who did not.

The quality of some of the studies was not high and most did not have enough people to evaluate the true effect of the services. The evidence we now have provides very little guidance for the development of these types of services.