A review comparing dialectical behavior therapy and mentalization for adolescents with borderline personality traits, suicide and self-harming behavior

A Review Comparing Dialectical Behavior Therapy and Mentalization for Adolescents with Borderline Personality Traits, Suicide and Self-harming Behavior

Olga Karagiorgou Johnstone[1], John J. Marshall[2], Lindsey Gilling McIntosh[2]

1. Specialist Children's Services, NHS Greater Glasgow and Clyde, Glasgow, Scotland
2. Psychological Services, The State Hospital's Board for Scotland, Lampits Road, Carstairs, ML11 8RP, Scotland

Corresponding author: John J Marshall, john.marshall@nhs.scot

Authors' Contributions

JM conceived the idea for the review, JM and OK set review criteria, OK completed database searching, screened abstracts and completed full text review, LGM completed secondary review of abstracts and full text, and quality assessment of included studies. All authors contributed to, read and approved the final manuscript.

Conflicts of interest

The authors report no conflict of interests.

Abstract

A growing number of evidence-based interventions have offered treatment for adults with Borderline Personality Disorder. Dialectical Behavior Therapy and Mentalization Based Therapy are both evidence-based treatments initially developed for chronically suicidal adults and have been adapted for adolescents relatively recently. There is increasing interest in treatment for Borderline Personality Disorder traits for adolescents using these two therapies. This article provides the results of a review of treatment outcomes for Dialectical Behavior Therapy versus Mentalization Based Therapy for adolescents. These interventions target Borderline Personality Disorder symptoms, self-harm and suicidal behavior. Adolescents with Borderline Personality traits are at considerable risk for suicide or long-term negative adult psychosocial outcomes. In order to assist clinicians and service providers in choosing the most appropriate treatment, six main electronic databases were searched from inception to April 11, 2019, to identify relevant studies. Twenty-five studies were included in this review; twenty-one on Dialectical Behavior Therapy for Adolescents and four concerning Mentalization Based Therapy for Adolescents. Significant improvements in suicidal ideation, suicidal attempts, self-harm (with or without suicidal intention), Borderline Personality Disorder symptoms, depressive symptoms, trauma, behavior problems and general functioning were reported for both interventions. In addition to outcome comparisons, this review contrasts the theoretical background and implementation issues of these two important psychological treatments for adolescents with Borderline Personality Disorder symptoms.

Introduction

Borderline personality disorder is characterized by instability in interpersonal relationships, self-image, and mood, along with a strong tendency for impulsivity, suicidal ideation and self-harm (Meuldijk et al. 2017). It can emerge during adolescence and can be reliably detected during that developmental period (Kaess et al. 2014). Dialectical Behavior Therapy and Mentalization Based Therapy have emerged as the commonly used therapies for addressing the disorder during adolescence. These therapies are different in terms of philosophy, training, and implementation. For clinicians to use the most appropriate therapy and researchers to investigate outcomes, it is important to understand the effectiveness of several outcomes that directly impact long term symptoms and subsequent psychosocial functioning: self-harm, suicide ideation, suicide attempts, and hospitalization outcomes. This article systematically reviews and evaluates research that focuses on how the different therapies effect these outcomes.

Dialectical Behavior Therapy (DBT)

Theoretical Background

Dialectical Behavior Therapy is a modified form of cognitive behavior therapy for individuals with Borderline Personality Disorder and other complex mental issues. Dialectical Behavior Therapy mainly aims to create the circumstances for patients to experience a life worth living. The therapy is underpinned by the following critical elements: biosocial theory; dialectical philosophy; acceptance-oriented approaches and behavior science. Biosocial theory assumes that the core feature of Borderline Personality Disorder is emotional dysregulation, which is characterized by a transaction between a biological disposition to be emotionally vulnerable and an invalidating childhood environment. Emotion vulnerability consists of emotional sensitivity and intensity, and difficulty returning to baseline. Therefore, individuals with Borderline Personality Disorder lack the skills needed to deal effectively with intense emotional situations (Linehan 1993a) and develop maladaptive forms of coping instead (e.g. self-harming).

Dialectical philosophy aims to keep Dialectical Behavior Therapy focused on the synthesis and integration of opposites, primarily highlighting the importance of balancing change-and acceptance-based approaches, (i.e. Dialectical Behavior therapists accept their patients as they are and at the same time help them to change in order to achieve their goals) (Swales et al. 2000). Dialectical Behavior Therapy dosage or treatment intensity

consists of a year-long highly structured treatment that includes individual therapy, group skills training, phone coaching and a therapist consultation team (Linehan 1993b). These components meet five key functions of treatment: (1) Enhancing capabilities, (2) generalizing capabilities, (3) enhancing motivation and decreasing dysfunctional behaviors, (4) addressing therapist capabilities and motivation, and, (5) structuring the environment. The targeted outcomes of Dialectical Behavior Therapy treatment are prioritized such that life-threatening and therapy-interfering behaviors are addressed first and second in treatment, respectively. The treatment then targets behaviors which reduce the individual's quality of life. Finally, Dialectical Behavior Therapy treatment turns the focus to behavioral skills acquisition through a combination of change- and acceptance-oriented skills to improve interpersonal effectiveness and emotion regulation abilities, increase mindfulness and distress tolerance.

Dialectical Behavior Therapy was first adapted for use with adolescents who exhibit self-harming and suicidal behavior, suicidal ideation and/or Borderline Personality Disorder traits by Miller et al. (1997). Dialectical Behavior Therapy for Adolescents shares the same theoretical background, modes, functions, targets and strategies with standard Dialectical Behavior Therapy.

Training and implementation

"Dialectical Behavior Therapy Intensive Training", an international method of training Dialectical Behavior Therapy therapists, accounts for the majority of teams trained in the United Kingdom. Considering that Dialectical Behavior Therapy is a cognitive behavioral treatment, teams need at least one person who has a thorough understanding of cognitive principles and techniques, behavioral therapy training, and has applied such methods in a clinical setting. In the United Kingdom, this requirement is fulfilled by either a clinician with an advanced qualification in clinical psychology or in Cognitive Behavior Therapy (Swales 2010). Dialectical Behavior Therapy Intensive training consists of two 5-day sessions of instruction, separated by 6 to 9 months of home study comprised of assignments. The first part of the training focuses on using videotapes, lectures and group exercises to teach the principles of establishing a Dialectical Behavior Therapy program (e.g. inclusion/exclusion criteria, treatment modalities, etc.) including its core strategies. During the second part of the program, following the period of home-study during which team participants consolidate and apply what they have learned with the aid of home assignments, teams are expected to utilize the

knowledge acquired during the first part and present both their program and individual cases currently in treatment in order to receive feedback and consultation. Additionally, further training on both the aspects of the Dialectical Behavior Therapy program and therapy is provided (Swales 2010). Finally, each team member must commit at least 15 h per (week to learning and delivering Dialectical Behavior Therapy. Dialectical Behavior Therapy therapists are supported by a DBT consultation team consisting of individual therapists and team leaders who meet weekly to assist each other in applying Dialectical Behavior Therapy by maintaining motivation to deliver effective treatment, enhancing clinical skills and monitoring fidelity to the treatment model (British Isles Dialectical Behavior Therapy Training 2020). Dialectical Behavior Therapy was adapted (Miller et al. 2007) to be more developmentally appropriate for use with adolescents (Dialectical Behavior Therapy for Adolescents; MacPherson et al. 2013). DBT-A treatment duration is 16-weeks, down from approximately 1-year with standard Dialectical Behavior Therapy. As part of Dialectical Behavior Therapy—for Adolescents family members are included in the skills training group. Family sessions are provided when needed, and a fifth skills training component called "Walking the Middle Path" was added, which aims to bridge communication between the family and the adolescent in treatment. Dialectical Behavior Therapy—for Adolescents treatment handouts and content was modified (e.g. change of terminology and language used) and the visual content simplified in order to appeal to young people (MacPherson et al. 2013).

Mentalization Based Therapy (MBT)

Theoretical Background

Mentalization Based Therapy is an integrative treatment approach that incorporates psychoanalytic ideas, developmental and attachment theories and social cognition research based on the human capacity to mentalize. Mentalization refers to the common psychological process by which we understand and interpret our own and other people's behavior in terms of mental states, such as, thoughts, beliefs, feelings, needs and desires. It is argued that the ability to mentalize is acquired through the formation of secure early attachments in childhood (i.e. we are capable of considering other people's mental states when during childhood our mental states were adequately understood by caring and non-threatening caregivers), (Bateman and Fonagy 2010). Unstable or reduced capacity to mentalize, a core feature of Borderline Personality Disorder (Borderline Personality Disorder; Fonagy et al. 2016) is thought to account for many symptoms that lead to

problems in sense of self, affect regulation and interpersonal relationships. However, an alternative Mentalization Based Therapy theory of Borderline Personality Disorder—the hypermentalizing theory—provides another explanation on the impact that mentalization has on the lives of people with Borderline Personality Disorder (Sharp and Vanwoerden 2015). This theory posits that the core feature of Borderline Personality Disorder is not the lack of ability to mentalize but the over-attribution of extreme mental states to other people. Recent re-examination of the mentalization model of Borderline Personality Disorder includes an extension of the theory to include such hypermentalizing (Bo et al. 2017).

Training and implementation

Training in Mentalization Based Therapy begins with a basic introductory 3-day training course followed by ongoing supervision by an Mentalization Based Therapy practitioner in the workplace (Anna Freud Centre 2019). Clinicians can progress to being Mentalization Based Therapy practitioners after completing a further 2-day training and with sufficient caseload experience using Mentalization Based Therapy. Mentalization Based Therapy trainees must possess a qualification in mental health (e.g. Mental Health Nurses, Occupational Therapists, Clinical/Counselling Psychologists, Psychiatrists, Psychotherapists and Social Workers), have a good knowledge of theories of personality disorders and have worked therapeutically with people who have a personality disorder for at least 1 year.

Mentalization Based Therapy interventions initially focus on regulating emotional expression and then on helping patients to increase or recover their capacity to mentalize. Mentalization Based Therapy is a year-long treatment which involves weekly individual and group sessions organized around the following therapeutic steps: (1) demonstration of empathy with the patient's current mental state, (2) exploration of the patient's mental processes without making suggestions, respond to patient's requests for clarification in a clear and direct manner that establishes a self-reflective stance open to correction, and challenge the patient's perspective whilst exploring their underlying emotional state, (3) Identification of the affect focus and, (4) improving patient's mentalizing abilities (Bateman et al. 2014). The Mentalization Based Therapy protocol was subsequently adapted for use with adolescents (Mentalization Based Therapy for Adolescents) (Rossouw and Fonagy 2012). Mentalization Based Therapy for Adolescents is a year-long manualized psychotherapy

program that involves weekly individual sessions as well as monthly family therapy sessions (Mentalization Based Therapy for Families) for the whole family to enhance their ability to mentalize.

Current Study

The central aim of this review is to contrast the outcomes and methodologies used in studies which assess the effectiveness of Dialectical Behavior Therapy versus Mentalization Based Therapy in the treatment of adolescents with Borderline Personality Disorder traits. The article focuses on a range of outcomes including self-harm, suicidality, Borderline Personality Disorder symptoms and admission to hospital. The article also focuses more widely on Dialectical Behavior Therapy and Mentalization Based Therapy outcomes concerning behavior problems, emotional regulation and quality of life indicators. Theoretical differences between Dialectical Behavior Therapy and Mentalization Based Therapy are considered along with the role of families in treatment. Wider implementation issues and research recommendations are made to enable greater clarity to emerge regarding differences in outcomes between both interventions.

Methods

Search Strategy

Articles for this review were identified through EBSCO (CINAHL, PsycINFO, PsycARTICLES, Psychological & Behavioral Sciences Collection), PubMed and Web of Science databases using the search query a) (Dialectical behavio* therapy OR dialectical behavio* treatment) AND (Adolescents OR teenagers OR youth) AND Borderline personality AND (suicid* OR self harm* OR self-injur*), and b) (Mentalization OR Mentalization) AND (Adolescents OR adolescence OR teenagers OR youth) AND Borderline personality AND (suicid* OR self harm* OR self-injur*). The search was restricted to articles that were written in English and were published by April 11, 2019. There were no other date limitations. Database search and screening title and abstracts for relevance were performed by one author (OK). The same author reviewed full text articles against inclusion criteria, and 25% were independently reviewed by a second reviewer (author LGM). There was complete agreement on inclusion between the two reviewers. Articles were included if they reported data collected from adolescents with age range 10–19 years, as per World Health Organisation guidance on adolescence age ranges, with at least one or more DSM-V diagnostic criteria for Borderline

Personality Disorder (BPD) and self-harm/suicidal behavior in outpatient, inpatient or correctional facilities. Articles were excluded if full text was unavailable (authors were contacted in all instances) or if the evaluation followed a case study design. Reference lists of the included studies and of recent reviews of Dialectical Behavior Therapy for Adolescents (DBT-A), Mentalization Based Therapy for Adolescents (MBT-A), interventions for borderline personality traits, suicide attempts/self-harm in adolescents were reviewed (author OK) to detect articles for review that did not emerge in our initial database search. Figure 1 outlines the study acquisition and inclusion process. Methodological quality was assessed using the National Institutes of Health (NIH) study quality assessment tools for controlled intervention studies and before-after studies with no control group (NIH 2020), according to the study design.

Results

Overview of studies

The current review resulted in 25 studies in outpatient and inpatient facilities; twenty-one DBT-A and four MBT-A studies (Table 1). The results for both interventions were generally positive and significant improvements in various treatment outcomes were reported. Given the heterogeneity in study design, inclusion criteria, selected outcome measures, as well as the modest sample sizes, lack of or inconsistent use of adherence measures and follow-up assessments, quantitative synthesis of the primary studies would not be appropriate. Therefore, this review presents the results of a narrative synthesis with appropriate recognition of study limitations. Most study designs were (1) pre-post, uncontrolled and (2) quasi-experimental studies. Only six randomized controlled trials (RCTs) were included; four evaluating DBT-A and two MBT-A. In all RCTs apart from one (McCauley et al. 2018) the comparison treatment was a version of usual care. The DBT-A studies showed heterogeneity in treatment duration and intensity, modes, strategies, skills, length of follow-up (Table 1; see Freeman et al. 2016 for more details). The three MBT-A studies utilized a variety of outcome measures, including those used to assess mentalization ability. In two MBT-A studies (Beck et al. 2019; Laurenssen et al. 2014) mentalization ability was not assessed.

Self-harm, Suicide Ideation, Suicide Attempts, BPD Symptoms, and Hospitalization

Self-injurious behavior (with or without suicidal intent) was assessed in all but four of the DBT-A studies and in three MBT-A studies (Beck et al. 2019; Bo et al. 2017; Rossouw and Fonagy 2012). The effect of treatment on suicidal ideation and suicidal attempts was only investigated by DBT-A studies. Self-injurious and suicidal behaviors were shown to be significantly decreased following DBT-A and MBT-A intervention (Bo et al. 2017; Buerger et al. 2019; Courtney and Flament 2015; Fleischhaker et al. 2011; Geddes et al. 2013; James et al. 2008, 2011; Katz et al. 2004; McCauley et al. 2018; Mehlum et al. 2014; Rossouw and Fonagy 2012; Tørmoen et al. 2014; Trupin et al. 2003; Woodberry and Popenoe 2008) and a number of studies reported this effect to be maintained at follow-up (Fleischhaker et al. 2011; Geddes et al. 2013; James et al. 2008; Katz et al. 2004; McCauley et al. 2018; Mehlum et al. 2016,2019; Tørmoen et al. 2014).

The effect of DBT-A on reducing self-harm and suicidal behavior was observed in three RCTs to be larger than that of enhanced usual care (Mehlum et al. 2014; 2016, 2019), treatment as usual along with the addition of group sessions (Santamarina-Perez et al. 2020) or individual and group supportive therapy (McCauley et al. 2018). Additionally, Mehlum et al.'s study (2019) that examined the long-term outcomes of DBT-A compared to enhanced usual care at 3-years post-treatment reported that receiving more than 3 months follow-up treatment over the first year after completing the trial treatment was associated with fewer self-harm episodes for participants who had received DBT-A. Enhanced usual care involved attendance at a Child Psychiatry Clinic for support and pharmacotherapy if required. Rossouw and Fonagy (2012) found that MBT-A was more effective in reducing self-harm (including suicidality) than treatment as usual (TAU), with a post-treatment recovery rate of 44% in MBT-A compared to just 17% in TAU. Risk-taking behavior was assessed in two MBT-A studies with mixed results; Bo et al (2017) found improvements pre to post treatment, and while in Rossouw and Fonagy (2012) participants in MBT-A arm of the of the Randomized Control Trial (RCT) reported reductions in risk-taking behavior, so did the participants in the TAU control arm receiving community-based adolescent mental health services. On the other hand, Beck et al. (2019) found no significant group differences in self-harm between group based MBT and TAU at the end of treatment.
It should be noted that most of the included studies which included a self-harm outcome failed to distinguish between self-harm with and without suicidal intent. Although both behaviors involve tissue damage and often co-occur, they are thought to serve different purposes; suicide is associated with thoughts of dying whereas

self-injury is associated with stress reduction (Muehlenkamp 2005). Given that the two types of behaviors have distinct etiologies and risk factors, and are differentially responsive to therapies, trialists and other researchers are encouraged to distinguish these behaviors when adopting an operationalized definition of self-harm.

Rates of psychiatric hospitalization was investigated mainly by DBT-A studies (Cooney et al. 2010; Fleischhaker et al. 2011; James et al. 2015; Mehlum et al. 2014, 2016; Rathus and Miller 2002) and one MBT-A study (Beck et al. 2019). Evidence from the DBT-A studies shows overall success in DBT-A reducing the use of emergency services from pre- to post-treatment, however controlled studies demonstrated this effect was not greater than that observed from other therapies which comprised TAU or the active comparator treatment (Cooney et al. 2010; McCauley et al. 2018; Mehlum et al. 2014, 2016). The only MBT-A study that explored hospitalizations and emergency room visit rates showed that there was a significant increase of those rates in the MBT-A group at the end of treatment. However, this difference might be attributed to two patients in the MBT-A group who had a diagnosis of schizophrenia and who contributed 78% and 25% of the total hospitalization days and emergency room visits, respectively, in both treatment groups (Beck et al. 2019). Most results in both the DBT-A and MBT-A evaluations included overall improvements in BPD symptoms (DBT-A—Buerger et al. 2019; Cooney et al. 2010; Geddes et al. 2013; Katz et al. 2004; James et al. 2011; Rathus and Miller 2002; Tormoen et al. 2014; MBT-A—Beck et al. 2019; Bo et al. 2017; Courtney and Flament 2015). Two MBT-A studies showed a significant decrease of BPD symptoms; 33% of MBT participants met diagnostic criteria vs. 58% of TAU participants (Rossouw and Fonagy 2012); 91% showed a reliable change on BSI (from a dysfunctional to a normative range) with 18% moving into the functional range (Laurenssen et al. 2014), and BPD symptoms dropped below clinical cut-off in 52% of participants in a pre-post study (Bo et al. 2017). One MBT-A study (Beck et al. 2019) found no significant reductions in BDP symptoms for both groups, in fact, 12 patients in the MBT group and 13 patients in the TAU group were reported to have higher scores on the Borderline Personality Features Scale at the end of the treatment than at baseline.

Psychiatric Symptoms, Behavior Problems, Emotional regulation, Quality of Life and General Functioning

Results in both types of intervention studies indicated overall improvements in: depressive symptoms (DBT-A—Katz et al. 2004; Cooney et al. 2010; Woodberry and Popenoe 2008; James et al. 2011; James et al. 2015; Mehlum et al. 2014; Tormoen et al. 2014; McCauley et al. 2018; MBT-A—Buerger et al. 2019; Courtney and Flament 2015 Rossouw and Fonagy 2012); behavior problems (DBT-A—Bo et al. 2017; James et al. 2011, 2015; Mehlum et al. 2016; Sunseri 2004; Tormoen et al. 2014), emotional regulation, trauma symptoms (i.e. anxiety (Geddes et al. 2013, depression (Geddes et al. 2013; Woodberry and Popenoe 2008), anger (Woodberry and Popenoe 2008), posttraumatic stress (Geddes et al., 2013) dissociation (Woodberry and Popenoe 2008), quality of life: (DBT-A- Bo et al. 2017; Geddes et al. 2013; Mehlum et al. 2014) and general/clinical functioning (DBT-A—Cooney et al. 2010; Freeman et al. 2016; Geddes et al. 2013; James et al. 2008; Katz et al. 2004; Mehlum et al. 2014, 2016; Santamarina-Perez et al. 2020). Previous research has indicated that adolescents who attended DBT-A reported a decrease of fear of depression and anxiety at 3-month follow-up (Geddes et al. 2013) whereas those who dropped out appeared to feel more depressed and hopeless (James et al. 2015). Additionally, research has shown that DBT-A treatment might be associated with a significant reduction in hopelessness which in turn was found to mediate a significant reduction of self-harm episodes (Mehlum et al. 2019).

Parent Involvement

Two DBT-A studies (Woodberry and Popenoe 2008; Uliaszek et al. 2014) explored parents' reports of change after treatment and reported mixed findings regarding parents' symptoms. Woodberry and Popenoe (2008) found large and statistically significant effect of DBT-A of parents' depressive symptoms at post treatment. While a similar treatment effect size was observed for caregivers' self-rated depression and hostility in Uliaszek et al. (2014), these effects did not reach statistical significance. The caregiver samples in both studies were small ($n = 16$) and in Uliaszek et al. (2014), the standard protocol for DBT-A was not followed; the multifamily skills training group module was delivered as an adjunct to treatment as usual.

Mentalization and attachment

Results in MBT-A studies revealed an overall improvement in mentalizing ability and attachment status. Rossouw and Fonagy (2012) reported a highly significant correlation ($p < 0.001$) between self-reported

attachment avoidance (but not attachment anxiety) and self-harm scores as well as mentalizing and self-harm scores from pre- to post-treatment. Multiple linear regressions including both mentalizing (HIF scores) and attachment (ECR scores) suggested strong independent associations with self-harm. Bo et al. (2017) found a significant improvement in 23 out of 25 participants in mentalizing combined with peer- and parent-attachment and BPD symptom reduction. An extension of the mentalization-based theory of BPD suggests that attachment, mentalization, and the concept of epistemic trust are all linked to the understanding of BPD. It has been hypothesized that interventions that aim to enhance mentalizing capacity will lead to improvements in borderline symptoms and interpersonal functioning which, in turn, will lead to the enhancement of the capacity to trust others and the establishment of epistemic trust (Bo et al. 2017). However, the statistical analysis does not provide us with a clear understanding of the relationship between the three variables.

Discussion

Dialectical Behavior Therapy and Mentalization Based Therapy are two commonly used therapies for adolescents with Borderline Personality Disorder traits. These interventions were initially developed for adults and have been recently adapted for adolescents. Given the increasing interest in adolescent Borderline Personality Disorder treatment using these two approaches, it is important to review the theoretical background, implementation and available empirical evidence of these two psychological treatments. This review compared the theoretical background, implementation and available empirical evidence of two psychological treatments for adolescents with Borderline Personality Disorder traits; Dialectical Behavior Therapy for Adolescents and Mentalization Based Therapy for Adolescents.

Twenty-five studies on the effectiveness of Dialectical Behavior Therapy for Adolescents and Mentalization Based Therapy for adolescents with Borderline Personality Disorder traits and suicidal/self-harm behavior were identified. Both Dialectical Behavior Therapy for Adolescents and Mentalization Based Therapy for Adolescents studies have yielded promising results in terms of suicidal ideation, suicidal attempts, self-harm (with or without suicidal intention), Borderline Personality Disorder symptoms, depressive symptoms, trauma, behavior problems and general functioning (Table 2).

Results from the current studies show the strongest effects of Dialectical Behavior Therapy for Adolescents treatment for adolescents who engage in repetitive self-harming behavior. Improvements were found to occur both early in engagement in treatment and after a significant amount of time had passed. The apparent efficacy of Dialectical Behavior Therapy in treating self-harm behavior is consistent with the therapy's prioritization of treatment targets to first the reduction of life-threatening behaviors and behaviors that interfere with therapy (Linehan 1993a).

The involvement of families in the Dialectical Behavior Therapy treatment is very important. Their incorporation in the multi-skill training group may enable them to acquire the needed skills to gain insight into their own and their children's behaviors, while becoming models and coaches for their children, which has the potential to contribute to the generalization and maintenance of such skills (Miller et al. 2002). Dialectical Behavior Therapy for Adolescents therapy family skills training was shown to be beneficial for the parents of adolescents with Borderline Personality Disorder symptoms or diagnosis; it gave them hope for the future, understanding and knowledge about the condition and useful tools that they can use in daily life. Additionally, Dialectical Behavior Therapy for Adolescents was found to be more beneficial for parents with more severe anxiety and depressive symptoms, perhaps due to applying skills taught and/or an improvement in home life (Ekdahl et al. 2014). The included studies have yielded mixed findings; one study found a significant reduction in parents' depressive symptoms (Woodberry et al. 2008) but the other study (Uliaszek et al. 2014) reported a non-significant improvement in anxiety and depression, albeit the latter presented a trend towards significance ($p = 0.065$). A possible explanation might be that the scores of the self-reported symptoms as assessed pre-treatment were already quite low and therefore a floor effect might have occurred.

In Dialectical Behavior Therapy for Adolescents studies, improvement in mentalizing was associated with an increase in interpersonal functioning and a reduction in self-harm (Rossouw and Fonagy 2012) and Borderline Personality Disorder traits (Bo et al. 2017). In fact, positive changes in mentalizing and interpersonal functioning were shown to be the mediating factors in reducing self-harm (Rossouw and Fonagy 2012). A variety of measures were used to assess mentalization ability, reflecting the difficulty in converging on one

operational definition of a broad and multi-faceted concept such as mentalization ability (Sharp 2014). In the three Dialectical Behavior Therapy for Adolescents studies included in this review, mentalization was purportedly assessed using the "How I feel" self-report questionnaire based on the concept of emotional intelligence (Rossouw and Fonagy 2012) and the Reflective Function Questionnaire for Youth (Courtney 2015). Despite reporting that measuring Dialectical Behavior Therapy for Adolescents' effects on mentalization ability was a primary aim of the study, Laurenssen et al. (2014) did not include any mentalization outcomes.

Other mentalizing measures that have been used in studies on mentalizing in adolescents with Borderline Personality Disorder include the computerized "Movie for the Assessment of Social Cognition", which measures non-mentalizing, under mentalizing, hyper-mentalizing, and accurate mentalizing, the "Child Eyes Test", which assesses explicit-controlled and external mentalizing (Laurenssen et al. 2014), and the "Mentalizing Stories Test for Adolescents" to assess implicit mentalizing and pseudo-mentalizing (Sharp et al. 2011, 2013). This difficulty in selecting from the many types of mentalizing abilities is compounded by the significant overlap of mentalization with other concepts, such as, empathy, mindfulness, affect consciousness, and psychological mindedness (Choi-Kain and Gunderson 2008). For this reason, more adequate measures are required to assess mentalizing in Borderline Personality Disorder and other disorders. Reflective Function Questionnaire for Youths is reported to be a valid and reliable measure to assess the adolescents' capacity to mentalize (Ha et al. 2013).

In Laurenssen et al. (2014) a pilot study of Dialectical Behavior Therapy for Adolescents in an inpatient service was terminated due to implementation issues; the symptom severity that patients presented, the ambiguity of the new role and tasks assigned to staff members as well as the uncertainty about how to apply the Mentalization Based Therapy model led to a loss of authority and increasing conflicts with patients. The lack of power and increase of conflicts resulted in low employee morale and increase of job dissatisfaction which in turn led to burn out among staff members and conflicts within the team. The staff members' burnout and the team conflicts were communicated to the patients who—already feeling overwhelmed by the major changes they had to deal with, including a new therapeutic model and changing rules—also felt

misunderstood, neglected and angry and exhibited challenging behaviors (e.g. acting out and crossing boundaries; Hutsebaut et al. 2012). All the aforementioned problems, including the conflicts with the patients and within the team, led to the termination of the study and the recommendation of an outpatient variant of Mentalization Based Therapy that retains the treatment components of inpatient Mentalization Based Therapy for adolescents.

Dialectical Behavior Therapy for Adolescents treatment was mainly focused on self-harm, suicidal behavior, hospitalization, depressive symptoms, emotional dysregulation, borderline personality symptoms (e.g. impulsivity, identity and relational issues), and behavior problems, and Mentalization Based Therapy for Adolescents treatment seems to focus on Borderline Personality Disorder and depressive symptoms, attachment and mentalizing issues. Dialectical Behavior Therapy treatment's goal is the reinforcement of practicing positive behaviors using a range of taught strategies whereas Mentalization Based Therapy's goal is to promote mentalizing and reflective functioning in order to render individuals able to find solutions themselves. The main philosophical difference between these two interventions is that Dialectical Behavior Therapy focuses on patients' behaviors whereas Mentalization Based Therapy on patients' minds. However, there is a considerable theoretical overlap of Dialectical Behavior Therapy and Mentalization Based Therapy in terms of what the cause of Borderline Personality Disorder is; Dialectical Behavior Therapy hypotheses that Borderline Personality Disorder is caused by the patient's emotional regulation problems as emerged in the context of an invalidating environment and Mentalization Based Therapy that Borderline Personality Disorder is caused by the patient's inability to form secure attachments with a caretaker in childhood—therefore, the patient becomes unable to interpret their own and other people's mental states (Swenson and Choi-Kain 2015).

This review compared the theoretical background, implementation and available empirical evidence of two psychological treatments for adolescents with Borderline Personality Disorder traits. These treatments are as yet difficult to compare, and any conclusions drawn should be considered tentative at this stage while the research literature develops. Several recommendations to be considered for future research are proposed which would facilitate comparisons between the two treatments. First, since Dialectical Behavior Therapy has

elements of mentalizing within it, there is an opportunity to test the effect of Dialectical Behavior Therapy on mentalization ability with the inclusion of outcome measures specific to mentalization. This would allow for direct comparison of the two treatments on efficacy of improving mentalization in adolescents with Borderline Personality Disorder traits. Second, given that Dialectical Behavior Therapy emphasizes the importance of family involvement in therapy to enhance the generalization and reinforcement of skills, future research is needed to determine whether family involvement (including multi-family training skills group and family therapy) may be acceptable and effective for both adolescents with Borderline Personality Disorder symptoms and their families. The noted effects of Dialectical Behavior Therapy observed in studies where the treatment included family members may be at least partially attributed to the validation and reinforcement of the concepts and skills covered in therapy to the home environment. Thirdly, taking into consideration that Dialectical Behavior Therapy hypothesizes that emotional dysregulation is causal in Borderline Personality Disorder and therefore teaches patients skills in how to regulate their emotions and respond to distress, it could be assumed that all Dialectical Behavior Therapy studies should include emotional regulation measures as study outcomes.

One of the main limitations found was the lack of randomized controlled evaluations of sufficient statistical power two enable more robust conclusions to be reached about both interventions. Such studies should adopt consistent inclusion criteria and may consider ways to recruit additional male participants, as females represent the overwhelming majority of the samples of studies conducted to date. Other weaknesses in the studies considered is the need for valid multi-faceted outcome measures (ideally a combination of self-reported and objective measures, including parent/caregiver feedback) and when self-harm behavior is used as an outcome, a clear operational definition should be adopted and reported. Where possible, more details should be provided on the nature, format and intensity of treatment provided in comparison conditions of usual care or treatment as usual.

Conclusion

Dialectical Behavior Therapy (DBT) and Mentalization Based Therapy are two therapies originally developed for adults with Borderline Personality Disorder and recently adapted for adolescents with Borderline

Personality Disorder traits. Borderline Personality traits emerge in adolescence and can quickly become entrenched patterns of relating. The treatment of adolescents with Borderline Personality Disorder traits is a critical endeavor for health and social care providers given poor psychosocial life outcomes transitioning to adulthood and suicide risk. This review sought to compare the outcomes for both therapies. Despite the outcome studies limitations and paucity of literature in the treatment of adolescents with Borderline Personality Disorder traits, particularly for Mentalization Based Therapy for Adolescents, clinicians and service providers need to make choices about the appropriateness of either therapy for adolescents. Both intervention types demonstrate significant improvements in suicidal ideation, suicidal attempts, self-harm, Borderline Personality Disorder traits, depressive symptoms, trauma, behavior problems and general psychosocial functioning. However, Dialectical Behavior Therapy for Adolescents with Borderline Personality Disorder traits who engage in repetitive self-harming behavior is more effective than Mentalization Based Therapy. Although both interventions differ in terms of theoretical underpinnings, mentalizing may be a common change mediator. Improving the measurement of mentalizing common to both interventions may allow for robust comparisons. Given the limitations of current studies examining Dialectical Behavior Therapy for adolescents and Mentalization Based Therapy for adolescents, scientific comparative trials are needed applying commonly agreed outcome measures. Determining which components of the therapies are efficacious in future comparisons will be critical along with contrasting the implementation barriers.

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Table 1. Characteristics of included studies

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
Miller et al. (2000)	12 weeks DBT-A: Weekly IT & multifamily STG, TC Family: Yes	Pre-post Outpatient	N = 27 F/M = 23/4 14–19	• Self-injurious behaviour (including suicide attempts) within last 16 weeks or current suicidal ideation, and • Diagnostic criteria for BPD or at least 3 BPD features		• Life problems inventory (LPI), • DBT skills rating scale for adolescents	US	Fair
Rathus and Miller (2002)	12 weeks DBT-A: Twice weekly IT & STG, TC, CT Family: Yes TAU: Twice weekly individual & family sessions of psychodynamic/supportive approaches	Quasi - experimental Outpatient	DBT = 29 F/M = 27/2 TAU = 82 (73% female) Estimated: F/M = 60/22 14–19	• Suicide attempt within last 16 weeks or current suicidal ideation • Diagnostic criteria for BPD or at least 3 BPD features • Participants who met criterion A or B but not both were assigned to TAU		• Beck depression inventory (BDI) • Life problems inventory (LPI) • Scale for suicidal ideation (SSI) • Symptom Checklist 90-Revised (SCL-90) • Number of psychiatric hospitalisations • Number of suicide attempts during treatment	US	Poor
Trupin et al. (2002)	10 months DBT-A + TAU: STG (once/twice weekly) TAU: Educational, recreational, vocational and behaviour modification programs, group meetings	Pre-post with control group Correctional facility	DBT1 = 22 (mental health population) DBT2 = 23 (general population) TAU = 45	• Adolescent females incarcerated at a Juvenile Rehabilitation Administration Facility		• Child and adolescent functional assessment scale (CAFAS, Hodges, 1995) • Rate of	US	Poor

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
			(general population) F/M = 45/0 14–15			functional impairment based on staff interview and chart review • Daily behaviour logs • Community risk assessment scores (CRA) intake and 3-month follow-up • The Massachusetts youth screening instrument (MAYSI, Grisso, 1999) baseline and 3-month follow-up		
Katz et al. (2004)	2 weeks DBT-A: 4 IT & 10 STG sessions, CT, DBT milieu Family: No TAU: At least once weekly individual and daily group psychodynamic psychotherapy, psychodynamic milieu	Quasi-experimental with 1-year follow-up Inpatient	N = 62 F/M = 52/10 DBT = 32 TAU = 30 14–17 One-year-follow-up: DBT = 26 TAU = 27	• Recent Suicide attempt or suicidal ideation severe enough to warrant admission • Bed availability at the time of admission determined which group (DBT/TAU) each participant was assigned to	Diagnosis of mental retardation; psychosis; bipolar affective disorder; or severe learning disabilities	• Beck depression inventory (BDI) • Kazdin hopelessness scale for children (KHS) • Reynolds' suicidal ideation questionnaire-JR (SIQ) • Number of incident reports completed by hospital staff • Lifetime parasuicide count (LPC)	US	Poor
Sunseri (2004)	DBT-A (29 months before & post-DBT):	Pre-post Residential Treatment	N = 68 (Before DBT) F/M = 68/0	• Adolescents who served in the Summitview		• Premature terminations • Number of	US	Poor

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
	Weekly IT, SGT (twice/week), TC, CT	Facility US	N = 26 (after DBT) F/M = 26/0 12–18	Child Treatment Centre- a residential treatment facility from 1997 to 2002		inpatients days • Duration of physical restraints and seclusions		
James et al. (2008)	DBT-A (1 year- two six-month blocks): Weekly IT & STG, TC Family: No	Pre-post with 8 months follow-up Community clinic	N = 16 F/M = 16/0 15–18	• History of at least 6 months 'persistent deliberate self-harm'	Diagnosis of: schizophrenia; bipolar disorder; autism; autistic spectrum disorder; or moderate/severe mental impairment	• Beck depression inventory (BDI) • Beck Hopelessness scale (BHS) • Global assessment of functioning (GAF) • Episodes of deliberate self-harm	UK	Good
Woodbery and Popenoe (2008)	DBT-A (15 weeks): Weekly IT, multifamily SGT (3 five-week modules), TC, CT, family therapy sessions Family: Yes	Pre-post Community clinic	N = 46 F/M = 41/5 13–18	• History of suicide attempts, self-injury within past 3–6 months and/or intense and unstable affect or relationships within past 3–6 months		• Reynolds' adolescent depression scale (RADS) • Behavior and symptom identification scale (BASIS) • Adult attachment scale (AAS) • Trauma symptom checklist for children (TSCC) • The child behavior checklist (CBCL) • Beck depression inventory (BDI)	US	Fair

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
Cooney et al. (2010)	26 weeks DBT-A: Weekly IT & GST, TC, CT Family: Yes, as needed TAU: Comprised of individual & family sessions, medication management, and hospitalisation and respite care as required. Treatment was dependent on the family context, the nature of presenting problems, diagnosis and formulation. CBT/ motivational interviewing/supportive counselling/narrative oriented family therapy were provided. Hospitalisation and respite care as required	RCT	N = 29 DBT = 14 F/M = 10/4 TAU = 15 F/M = 12/3 13–19	• History of at least one suicide attempt or one episode of intentional self-injury within last 3 months preceding the pre-treatment assessment • Consistence presence in the adolescent's life of at least one adult who was willing to take part in treatment along with them • Have proficiency in English	• Non-proficient in English • Diagnosis of intellectual disability or psychotic disorder at the time of the screening assessment	• Beck scale for suicide ideation (BSS) • Difficulties in emotion regulation • Scale (DERS) Substances and choices scale (SACS)	New Zealand	Poor
McDonell et al. (2010)	1 year: DBT group (three intensity levels): *Milieu DBT* (chain analysis, behavioural interventions and individual skills), *Group DBT* (milieu and DBT SGT) OR *Full DBT* (milieu, skills training group, and individual DBT) Historical group: Individual and family psychotherapy as needed	Pre-post with historical control group Inpatient psychiatric facility	DBT n = 106 (age = 12–17) Discharged 2000–2005 Historical control group n = 104 (Age = 12–15)	Voluntary and involuntary admissions Non-suicidal self-injurious behaviour (NSIB)	Admissions for legal competence restoration	• Length of stay (months) • Discharge placement • Change in number of psychiatric medication • Functional status (CGAS) • Frequency of locked seclusions • Non-Suicidal self-injurious behaviour (NSIB)	US	Fair

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
Fleischhaker et al. (2011)	DBT-A (16–24 weeks): Weekly IT & multifamily SGT, TC, CT Family: Yes	Pre-post with 1-year follow-up Outpatient	N = 12 F/M = 12/0 13–19	• Non-suicidal self-injurious and/or suicidal behaviour in last 16 weeks or current suicidal ideation • Diagnostic criteria for BPD or at least 3 features	Cognitive performance below 70 Present diagnosis of: psychotic disorder; severe depressive episode or mania Substance abuse or eating disorder as primary diagnosis Illiteracy	• Lifetime parasuicide count (LPC) • Global assessment scale of function (GAF) • Clinical global impression (CGI) • Inventory of life quality in children and adolescents (ILQ) • Symptom checklist- 90-revised (SCL-90-R) • Child behaviour checklist (CBCL) • Youth self report (YSR) • Depression inventory for adolescents and children (DIKJ)	Germany	Fair
James et al. (2011)	DBT-A (1 year- two 6-month blocks): Weekly IT & STG, TC, CT, carers' training, outreach components, e.g. providing meals, away weekends, transportation Family: Yes	Pre-post Community clinic	N = 25 F/M = 22/3 13–17	• History of at least 6 months 'persistent deliberate self-harm'	Diagnosis of: schizophrenia; bipolar disorder; autism; autistic spectrum disorder, and moderate and severe mental impairment	• Beck depression inventory (BDI) • Beck hopelessness scale (BHS) • Attachment style questionnaire (ASQ) •Children's automatic thoughts scale (CATS) • Comprehensive	UK	Fair

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
						quality of life scale (ComQoL-S) • Global assessment of functioning (GAF) • Number of self-harm episodes (clinical interview)		
Geddes et al. (2013)	18–26 weeks DBT-A: Weekly IT (26 weeks) & multifamily STG (18 weeks), TC, CT Family: Yes	Pre-post with 3 months follow-up Community based CAMHS	N = 6 F/M = 6/0 13–18	• Average cognitive ability (clinician's notes, school records) and established reading level (year 5), as measured by the Neale Analysis of Reading Ability • Deliberate self-harm and/or suicidal ideation within the last 12 months • A minimum of three BPD features	• A primary diagnosis of psychotic disorder • A primary diagnosis of substance abuse • An intellectual disability	• Self-Harm/Suicidal thoughts questionnaire: parents and adolescents versions • Modified Affective control scale for adolescents (MACS-A) • Trauma symptom checklist for children (TSCC)	Australia	Good
Uliaszek et al. (2014)	16 weeks DBT-A as an add-on to treatment as usual: IT (various treatment modalities, i.e. DBT, CBT, supportive therapy) & weekly multifamily STG, CT—no independent therapy for	Pre-post Community outpatient clinic	Adolescents: N = 13 F/M = 11/2 Caregivers: N = 16 F/M = 10/6 13–18	• Seeking treatment for symptoms and behaviours associated with borderline and externalising pathology	• Developmental or intellectual limitations	• International personality disorder examination (IPDE) • Child behaviour checklist (CBCL) • Youth self report	Canada	Poor

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
	parents Family: Yes			• At least one caregiver willing to participate in the multifamily DBT skills group		(YSR) • Symptom checklist 90-revised (SCL-90-R)		
James et al. (2014)	DBT-A (16–32 weeks): Weekly IT and/or family therapy, multifamily SGT, weekly parent education group Family: Yes	Quasi-experimental Intensive outpatient	DBT1 = 45 DBT2 = 55 12–18	• History of self-injurious behaviours with or without suicidal intent (e.g. NSSI) within the last 12 months • Be willing to participate in all program components along with their parents/guardians		• Youth outcome questionnaire-self-report 2.0 (Y-OQ-SR) • Parent version of the youth outcome questionnaire (Y-OQ 2.01) • Psychiatric hospitalization while in DBT • Discharge reason from DBT	US	Poor
Mehlum et al. (2014, 2016, 2019)	19 weeks DBT-A: Weekly IT & multifamily STG, family sessions, TC, CT EUC: Standard care enhanced by 1 weekly treatment session—psychodynamic/cognitive behavioural therapy combined with psychopharmacological treatment as needed	RCT with 1- and 3-year follow-up Psychiatric outpatient clinic	N = 77 DBT = 39 EUC = 38 1-year follow-up: N = 75 DBT = 38 EUC = 37 12–18 3-year follow-up: N = 71 DBT = 37 EUC = 34	• Screened positively for self-harming behaviour • A history of at least 2 episodes of self-harm, at least within the last 16 weeks • At least 2 criteria of DSM-IV BPD or at least 1 criterion of DSM-IV BPD plus at least 2 sub-threshold-level criteria	Diagnosis of bipolar disorder (except bipolar II); schizophrenia; schizoaffective disorder; psychotic disorder not otherwise specified; intellectual disability; Asperger syndrome	• Suicidal ideation questionnaire (SIQ-JR) • Moods and feelings questionnaire (SMFQ) • Beck hopelessness scale (BHS) • Borderline symptom list (BSL) • Number of self-reported self-harm episodes • Montgomery-	Norway	Good

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
						Asberg depression rating scale (MADRS)—baseline and 19 weeks • Hospital admissions and emergency department visits because of self-harm during the trial • Child behavior checklist (CBCL) • Children's global assessment scale (C-GAS) • Lifetime parasuicide count interview (LPC) • Suicide intent scale (SIS)		
Courtney and Flament (2015)	DBT-A (15 weeks): Weekly IT & STG, TC, CT Family: Yes	Pre-post Tertiary care centre	N = 61 F/M = 57/4 15–18	• Self-injurious thoughts and behaviours (SITB), including suicidal ideas, suicide attempts, and non-suicidal self-injurious behaviour (NSSIB) • Patients demonstrating	Frank psychosis and developmental delay	• Suicidal ideas questionnaire • Chart review to measure self-harm • Life problems inventory (LPI) • Resiliency scales for children and adolescents (RSCA) • Adolescent alcohol and drug involvement scale (AADIS)	Canada	Fair

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
				adequate motivation		• Treatment completion status		
Tormoen et al. (2014)	16 weeks DBT-A: Weekly IT & multifamily STG, TC, CT Family: Yes	Pre-post With 1-year follow-up Psychiatric Outpatient Clinic	N = 27 F/M = 26/1 12–18	• More than one lifetime episode of self-harm with one of the episodes within the last 4 months • Three or more criteria of DSM-IV BPD Willingness to receive DBT • Ability to speak Norwegian	• Mental retardation • An autism spectrum disorder • Psychotic disorder, or • Severe anorexia nervosa or Severe substance abuse disorder requiring specialized treatment	• Lifetime parasuicide count (LPC) • Diary cards • Number of psychiatric hospitalizations during treatment • Information on self-harm at follow-up	Norway	Poor
Khalid-Khan et al. (2016)	15 weeks DBT-A **'Managing Powerful Emotions' (MPE)—weekly STG (adolescents only), separate parent sessions**: – Introduces a psychodynamic component which places emphasis on fostering secure attachments – Second module of a three-phase stepped care model – All participants had previously completed an 8-week group on distress tolerance and move onto a more intensive 6-month DBT program if required further treatment	Pre-post Outpatient Clinic	N = 12 F/M = 10/2 N = 7 (inc in the analyses) F/M = 1/6	•Had previously successfully completed an 8-week group on distress-tolerance skill building; all participants diagnosed with either BPD or BP traits by a child and adolescent psychiatrist using DSM-V criteria	• Severe substance use & dependence • Psychosis • Active legal charges	• Beck's youth inventories (BYI) • Strengths and difficulties questionnaire (SDQ) • Youth quality of life questionnaire (YQOL-SF) • March's Multidimensional anxiety scale for children (MASC) • Kovac's Children's Depression Inventory 2 (CDI2)	Canada	Fair

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
McCauley et al. (2018)	6 months DBT-A: Weekly IT, SGT, TC, TC Family: Yes (≤ 7 family sessions) Individual and group supportive therapy Individual sessions, adolescent supportive group therapy, as-needed parent sessions (≤ 7 sessions), Therapists available by telephone, crisis numbers provided	Multi-site RCT with 1-year follow-up Outpatient	DBT = 86 F/M = 82/4 IGST = 87 F/M = 81/6 12–18	• At least 1 lifetime suicide attempt, elevated past-month suicidal ideation • Self-injury repetition (≥ 3 lifetime self-harm episodes, including 1 in the 12 weeks before screening), • 3 or more borderline personality disorder criteria, • Age of 12 to 18 years	• IQ less than 70 on the Kauffman Brief Intelligence Test23 • Primary problem of psychosis, mania, anorexia, or life-threatening condition; • Youth without English fluency • Parent without English or Spanish fluency	• At 3,6 9 and 12 months: • Suicide attempt self-injury interview (SASII) • Schedule for affective disorders and schizophrenia for school-aged children [KSADS] • Structured clinical interview for the *DSM-IV*, axis II [SCID-II]) • Suicidal Ideation questionnaire junior (SIQ-JR), • Drug use screening inventory (DUSI) • Child behaviour checklist	US	Good
Buerger et al. (2019) Santamarina-Perez et al. (2020)	DBT-A (25 weeks): Weekly IT, 20 sessions of SGT, family therapy sessions, TC, CT Family: yes 16 weeks DBT-A: Biweekly IT, SGT (attended separately by adolescents and parents), CT, TC, Family: Yes TAU + GS: Biweekly IT incl. specific interventions, counselling, elements of cognitive behaviour therapy,	Pre-post Outpatient	N = 72 F/M = 66/6 12–17 N = 35 DBT-A = 18 F/M = 16/2 TAU + GS = 17 F/M = 15/2	• At least three criteria of BPD (measured by the Structured Clinical Interview for DSM-IV-Axis II) and • Sufficient knowledge of the German language • Presence of repetitive NSSI	• Acute psychotic disorder and/or • Acute intention to commit suicide or intention to harm others that required inpatient treatment; • Impairment of intellectual functioning • Diagnosis of bipolar disorder, schizophrenia, or	• Structured clinical interview for DSM-IV-Axis II (German version) • Self-injurious thoughts and behaviours Interview (SITBI-German version) • Life problems inventory (LPI) • Symptom Checklist SCL-90-	Germany Spain	Fair Good

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
	or psychoeducation, SG (attended separately by adolescents and parents)			and/or SAs over the last 12 months • At current high risk of suicide (assessed by the Columbia Suicide Severity Rating Scale; C-SSRS) • At least one parent or guardian willing to participate in family sessions	schizoaffective disorder • IQ below 70 on the Wechsler Intelligence Test • Acute psychopathology requiring inpatient treatment at the time of recruitment • Low-weight anorexia nervosa	Revised (SCL-90-R) • Global Severity Index (GSI) • At week 4, 8, 12, 16: • Frequency of NSSI; self-injurious behaviour in the absence of lethal intent • Frequency of SA; self-injurious behaviour with intention to die • Global assessment scale (C-GAS) • Suicidal ideation questionnaire (SIQ-JR) • Depression Inventory-II (BDI-II); • Number of sessions attended, number of visits to the emergency room, emergency calls to therapist, inpatient psychiatric admission, partial hospitalisation		

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
Rossouw and Fonagy (2012)	1 year MBT-A: Weekly Individual MBT-A sessions and monthly MBT-F (family) sessions TAU: Routine care by community based adolescent mental health services e.g. individual therapeutic interventions; individual and family therapy combined; or psychiatric review alone	RCT Outpatient	N = 80 MBT = 40 TAU = 40 F/M = 68/12 12–17	• Presenting with at least one episode of confirmed self-harm within the past month, and for whom self-harm was the primary reason for referral and was confirmed as intentional	• Individuals with a comorbid diagnosis of psychosis, severe learning disability (IQ < 65), pervasive developmental disorder or eating disorder in the absence of self-harm • Concurrent substance misuse was not exclusion criterion, but chemical dependence was	• Risk-taking and self-harm inventory (RTSHI) •Mood and feelings questionnaire (MFQ), • RTSHI, risk-taking scale • Borderline personality features scale for children (BPFS-C) • How I Feel (HIF) questionnaire—measuring mentalisation (unpublished data, 2008) • Experience of close relationships inventory (ECR), assessing attachment status; consists of two independent scales of attachment insecurity; attachment avoidance and attachment anxiety	UK	Good
Laurenssen et al. (2014)	MBT-A (up to 12 months): Group psychotherapy and individual psychotherapy sessions, art therapy, writing therapy, and mentalizing,	Pre-post Inpatient	N = 11 F/M = 11/0 14–18	• Meeting at least two to nine DSM-IV criteria for BPD	Presence of a psychotic or organic brain disorder and mental retardation	• Dutch version of the Brief symptom inventory (BSI, Derogatis 1975) • The severity	Netherlands	Fair

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
	cognitive therapy, family therapy sessions, social work, psychiatric consultations and individual coaching available if and when needed					indices of personality problems (SIPP-118) • Quality of life: EuroQol EQ-5D (EQ-5D)		
Bo et al. (2017)	MBT-A (1 year): Group based MBT- Introduction (6 sessions) MBT-Group therapy (34 sessions) MBT-Parents (7 sessions)	Outpatient child and adolescent psychiatric clinics	N = 34 F/M = 34/0	• Meeting at least four out of the nine DSM-5 BPD criteria • Parents' or parent substitutes' commitment to participate in the MBT-Parents program and to support their child's participation in the program	• Comorbid diagnosis of pervasive developmental disorder • Learning disability Anorexia • Current psychosis • Diagnosis of schizophrenia or schizotypal and antisocial PD • Current substance abuse	• Borderline personality features scale for children (BPFS-C) • The youth self-report (YSR) •Beck depression inventory for youth (BDI-Y) • Risk-taking and self-harm inventory for adolescents (RTSHI-A) • Inventory of parent and peer attachment—revised (IPPA-R) • Reflective function questionnaire for youth (RFQ-Y)	Denmark	Poor
Beck et al. (2019)	MBT-A (1 year): MBT-Introduction (3 sessions) MBT-Group (37 weekly sessions) MBT-Parents (6 sessions) (90 min sessions)		N = 112 F/M = 111/1 14–17	• Meeting at least four DSM-5 BPD criteria • Having a total score above clinical cut-off (> 67) on The	• Comorbid diagnosis of: pervasive developmental disorder, learning disability (IQ < 75),	• Patients:Borderline personality features scale for children (BPFS-C) • Beck's depression	Denmark	Good

Authors	Intervention format	Design & setting	Participant information	Inclusion criteria	Exclusion criteria	Outcome measures	Country	Study quality
	TAU: Standardized individual monthly supportive sessions (at least 12), Comprised psychoeducation, counselling, and, if needed, ad hoc crisis management and sessions with caregiver participation			Borderline Personality Features Scale for Children (BPFS-C)	anorexia, current psychosis, diagnosis of schizophrenia or schizotypal personality disorder, antisocial personality disorder and any other mental disorder other than BPD considered the primary diagnosis • Current (past 2 months) substance dependence (but not substance abuse) Current psychiatric inpatient treatment	inventory for youth (BDI-Y) • Risk-taking and self-harm inventory for adolescents (RTSHIA) • Youth self-report (YSR) • Zanarini rating scale for borderline personality disorder (ZAN-BPD) • Children's global assessment scale (CGAS) • Number of patients' hospital admissions and visits to the emergency room • Caregivers: • Borderline personality features scale-parent • Child behaviour checklist (CBCL)		

1. *TAU* treatment as usual, *EUC* Enhanced usual treatment, *F/M* Female/Male, *BPD* Borderline personality disorder, *MPE* managing powerful emotion, *IP* individual therapy, *SGT* skills group training, *GS* group sessions, *TC* telephone coaching, *CT* consultation team, *FI* family involvement

Table 2. Outcomes of included DBT-A and MBT-A studies

Authors	Findings	Completion rates %
Miller et al. (2000)	• Significant decrease of symptoms in all four areas targeted by DBT: confusion about self, impulsivity, emotion instability, and interpersonal problems • All skills were rated between moderately and extremely helpful; acceptance skills (i.e. distress tolerance and mindfulness) were rated as most helpful	Examined only treatment completers
Rathus and Miller (2002)	• More severe psychopathology at baseline, but significantly fewer inpatient psychiatric hospitalisations (i.e. 0% vs. 13%) and greater treatment completion rate (62% vs. 40%) at post-treatment for the DBT group • No significant differences in number of suicide attempts during treatment; 1 (DBT) vs. 7 (TAU) suicide attempts **• Significant reductions in suicidal ideation, depression anxiety, general psychiatric and borderline symptoms within the DBT group (the TAU group was not administered posttreatment measures)**	DBT-A: 62 TAU: 40
Trupin et al. (2002)	•The mental health population unit **showed significant decrease in serious behaviour problems (suicidal/self-harm behaviour, aggression, classroom disruptions**) • Decreased use of punitive responses by staff on DBT1—mental health unit (who received more DBT training than the DBT2 unit; 80 vs 16 h) compared to the prior year • No behaviour/staff changes noted on the other units	N/A
Katz et al. (2004)	• Significant reduction in behavioural incidents on the DBT ward (e.g. violence toward self and others; DBT = 2, TAU = 10) compared to TAU at discharge **• Significant reduction in parasuicidal behaviour, depressive symptoms and suicidal ideation in both groups at 1-year follow-up**	Examined only treatment completers
Sunseri (2004)	• Premature terminations due to suicidality or psychiatric hospitalisations were significantly decreased for the post-DBT compared to the pre-DBT period (0% vs. 16.7%) • Number of inpatient days (71 days from 8 participants vs. 42 days from 6 participants) and length of time held in restraints/seclusion (median of 20 min vs. 11 min) significantly reduced from pre- to post-DBT period	N/A
James et al. (2008)	**• Significant reduction of self-reported depression, hopelessness, episodes of self-harm, general functioning—all of them were maintained at 8-month follow up**	87.5
Woodberry and Popenoe (2008)	• First study to collect parents' reports on adolescent and parental change **• Significant reduction of suicidal, life threatening and therapy interfering behaviours** • By the end of treatment, the percentage of those who wanting to (1) kill and (2) hurt themselves at baseline decreased from (1) 32–5% and (2) 50–21% • Significant improvement in depressive symptoms, anger, dissociation, overall functioning • Reduction in adolescent internalising, externalising and total problem behaviours reported by parents • Significant reduction in parents' depressive symptom	63 86 parents

Authors	Findings	Completion rates %
Cooney et al. (2010)	• Reduction in self-harming behaviour, suicide attempts, emergency admissions, and, emotional regulation problems for both DBT &TAU groups • No significant differences in self-harm, emergency admissions, and substance use between groups • No significant differences in suicide attempt, however fewer people in TAU group attempted suicide • Focus groups and therapist surveys indicated acceptability of DBT	93
Mcdonell et al. (2010)	• Significant increase in overall functioning **• Decrease in prescribed numbers of psychotropic meds and non-suicidal self-injurious behaviour** • Not observed decrease in locked seclusions	N/A
Fleischhaker et al. (2011)	• Significant decrease of BPD symptoms (2 participants were diagnosed with BPD at one-year follow-up vs. 10 participants pre-DBT) **• Significant reduction at one-year follow-up in: suicidal behaviour (no suicide attempts during study and at 1-year follow-up vs. 8 of 12 participants had attempted suicide at least once pre-DBT), and non-suicidal self-injurious behaviour post-DBT** **• Significant improvement in overall functioning and depressive and psychopathological symptoms post-DBT and at follow-up** • Decrease in length of inpatient treatment during therapy (6 participants had inpatient treatment at least once pre-treatment vs. 3 at follow-up—2 of which dropped out of the DBT therapy)	75
James et al. (2011)	•Significant reduction of self-harm, depression and hopelessness •Significant increase of global functioning	72
Geddes et al. (2013)	**• Reduction in suicidal ideation and non-suicidal self-harming behaviours after treatment and at 3-month follow-up; 5/6 participants had stopped self-harming and the remaining participant reported a reduction of 50%** • Reduction of trauma-based symptoms (i.e. anxiety, depression, anger, posttraumatic stress) after treatment and at 3-month follow-up—apart from anger which was largely decreased in mean scores, but the decrease was nonsignificant • Improvement of emotion regulation with fear of anger being decreased at post-treatment but not maintained at follow-up, and fear of depression being significantly decreased at follow-up	66.67
Uliaszek et al. (2014)	• Significant reduction in externalising, internalising, aggression, rule-breaking, aggression and attention problems in the adolescents reported by caregivers • No significant decrease in symptoms reported by adolescents (but changes in externalising & aggressive behaviours showed a large effect size) • Significant reduction of BPD symptoms from pre- to post-DBT from 5.10 (SD¼ 4.04) to 1.10 (SD ¼ 1.66) • Caregivers' self-reported behaviours, i.e. depression, anxiety, hostility and interpersonal sensitivity decreased but not significantly with changes in hostility and depression showing a medium effect size	75

Authors	Findings	Completion rates %
James et al. (2015)	• No differences between funding types regarding psychiatric hospitalization while in DBT treatment • Regardless of funding type, significant improvement in clinical functioning between pre-test and post-test across all measured domains, including self-reported self-injury in both DBT groups	80 (private insurance) 62 (grant-funded) 71 (in total)
Mehlum et al. (2014, 2016, 2019)	• DBT-A superior to EUC in reducing suicidal and self-harm behaviour, suicidal ideation and depressive symptoms with large effect sizes for treatment outcomes in DBT-A and moderate or weak in EUC • No significant group differences in borderline symptoms and hopelessness post-DBT • Significant reduction in self-reported depression for both groups but in interviewer-rated depression only for the DBT group • Low use of emergency services for both interventions—fewer admissions for DBT participants, but not significant • First follow-up (2016): Significant between-group differences in self-harm for the DBT group but not in suicidal ideation, global functioning, hopelessness and borderline and depressive symptoms • Second follow-up (2019) Significant group difference in frequency of self-harm episodes for DBT-A No significant differences between treatment groups for self-ideation, depressive symptoms, hopelessness, borderline symptoms and general functioning– both groups remained on average at the same levels as at the first follow-up (2016) A reduction in hopelessness during the trial treatment period mediated a substantial proportion (70.8%) of the effect of DBT-A in reducing self-harm frequency Receiving more than 3 months follow-up treatment the first year after completion was associated with further enhanced outcomes in patients who had received DBT-A	74.4 (2014)
Courtney and Flament (2015)	• Severe and complex degree of illness and dysfunction Highly significant decrease in suicide ideation **• Significant reduction in the proportion of participants who self-harmed [pre-treatment vs 4-month post-treatment, i.e. 85.7% vs. 38.1%]** • Significant reduction of Life Problem Inventory (LPI) total and sub-scores (confusion, emotional dysregulation and impulsivity) • Significant improvement of resilience scores, but not in interpersonal difficulties scores	49
Tormoen et al. (2014)	• Significant reduction of urges to self-harm and attempt suicide • 43% reported non-suicidal self-harming behaviour during the first 2 weeks of treatment, whilst only 14% reported such behaviours within the last 2 weeks **• 1-year follow-up: 10/27 only participants were traced and 7/10 reported no harm**	78
Khalid-Khan et al. (2016)	• Reduction in anxiety symptoms (large effect size) and disruptive behaviours (medium effect size) • Increase in emotional symptoms and hyperactive/inattentive symptoms at post-treatment (medium effect size)	58.3

Authors	Findings	Completion rates %
Mccauley et al. (2018)	• **DBT was associated with significantly higher rates of clinically significant change at 6 months post-treatment** • From baseline to 6 months, 9.7% of DBT participants vs 21.5% of IGST participants reported suicide attempts; 1 adolescent in the IGST group died by suicide in the follow-up period • At 6 months, 46.5% of DBT participants showed no self-harm vs 27.6% of IGST participants • No significant group differences at 12 months on primary outcomes; 51.2% of DBT participants and 32.2% of IGST participants were self-harm free • The DBT group attended significantly more treatment sessions and remained in treatment for more weeks than the IGST group	DBT: 75.6 IGST: 55.2
Buerger et al. (2019)	• Significant decrease in the number of BPD criteria met and in the incidence of every BPD symptom • The highest reduction on the symptom level was observed for "affective instability" and "chronic feelings of emptiness" • Two suicide attempts, but no completed suicide occurred during the treatment • Significant decrease of the frequency of NSSI episodes during the treatment • Significant reduction of the frequency of suicide attempts at the end of treatment • Highly significant reduction of self-reported borderline symptoms (LPI) and personal distress (GSI)	*18.1% dropout rate
Santamarina-Perez et al. (2020)	• Significant improvement in non-suicidal self-injury, antipsychotic medication and global functioning for DBT-A group • No significant group differences in suicidal ideation and depressive symptoms—both treatments were equally effective • No significant group differences in partial hospitalisation days during treatment period • Both treatment groups: reduction of suicide attempts over the treatment period but no reported suicide attempts at the end of treatment	*DBT-A = 22.2% TAU + GS = 17.6 *dropout rates
Rossouw and Fonagy (2012)	•Significant reductions in self-harm and risk-taking behaviours for both groups • At 12 months, self-harm scores significantly lower for MBT, but no difference in risk-taking • Decrease in depression for both groups; moderately greater for MBT during therapy and significantly greater at 12 months • 56% continued to self-harm & 49% still depressed at 1-year follow-up • Reduction in BPD diagnoses and symptoms; at 12 months, 58% of TAU participants but only 33% of MBT participants met criteria for diagnosis, and significantly greater reduction of borderline traits for MBT participants • Improvement of mentalisation and decrease of self-reported attachment avoidance	50
Laurenssen et al. (2014)	• Significant reduction in BPD symptoms; 91% showed a reliable change on the Brief Symptom Inventory (BSI); 18% moved into the functional range of BSI • Significant improvement in personality functioning [especially in self-control, social concordance, identity integration and responsibility] and quality of life scores at 12 months (medium to large effect sizes)	73.3
Bo et al. (2017)	• Significant reduction of borderline personality traits, general psychopathology, mentalising, peer and parent attachment, self-harm, and depressive features • For 52% of the participants borderline symptoms dropped below clinical cut-off • No significant improvements in externalising psychopathology and risk-taking behaviour	73.5

Authors	Findings	Completion rates %
	• Increase in peers and parents' trust combined with enhanced mentalising capacity was associated with greater reduction in borderline symptoms	
Beck et al. (2019)	• No significant reductions in BPD symptoms for both groups • No statistically significant group differences for depression, internalising and externalising symptoms and self-harm • No statistical improvement in self-harm behaviour pre and post both treatments • Higher rate of days of hospitalisation and emergency rooms visits in the MBT group. However, this difference is related to two patients with a diagnosis of schizophrenia in the MBT group who accounted for 78% and 25% of the total hospitalisation days and emergency room visits respectively in both treatment groups	MBT = 44 TAU = 75

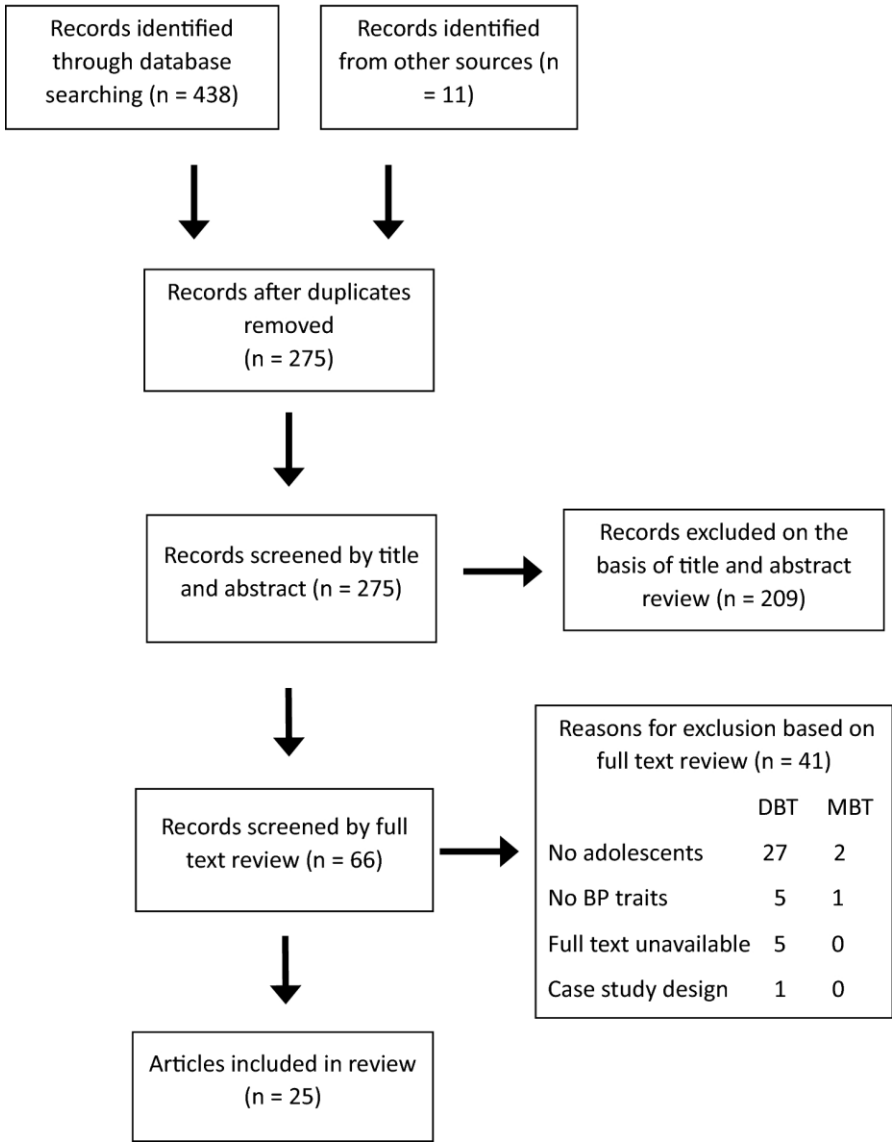

Figure 1
Flow diagram of study selection