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Psychological Interventions for Self-harm Behaviour and Suicide Attempts in Borderline Personality Disorder: A Systematic Review

Borderline Bireylerde Kendine Zarar Verme Davranışı ve İntihar Girişimine Yönelik Psikolojik Müdahaleler: Sistematik Derleme

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ABSTRACT

Self-harm behaviour and suicide attempts are considered maladaptive coping mechanisms by individuals with a diagnosis of borderline personality disorder (BPD). Numerous studies have demonstrated that individuals with BPD are at a heightened risk for self-harm behaviour and suicide. Therefore, there is a need for intervention efforts aimed at reducing self-harm and suicide attempts in this population by promoting more functional coping strategies. No systematic review has been conducted to explore the effectiveness of such interventions. A systematic review was performed to identify randomized controlled trials of interventions to reduce self-harm and suicide attempts among individuals with BPD, published between 2012 and 2022. PsycARTICLES, PubMed, Web of Science, Science Direct, and Taylor & Francis databases were examined in the review. A total of 6,760 studies were initially screened, only 13 were selected for review based on the inclusion and exclusion criteria. The results indicated that the standard dialectical behaviour therapy protocol, with the addition of psychological intervention components such as skills training, exposure and acceptance, statistically significantly increased recovery. Statistically significant results have been obtained from various psychotherapeutic intervention groups such as schema therapy, cognitive behavioural therapy and emotion regulation therapy However, it was noted that existing protocols might be inadequate in preventing relapse and addressing potential negative outcomes such as premature termination of therapy.
Keywords: Borderline personality disorder, self-harm, suicide, psychological intervention

ÖZ

Kendine zarar verme davranışı ve intihar girişimi, borderline kişilik bozukluğu tanılı bireylerin başvurduğu uyumsuz baş etme yöntemleri olarak kabul edilmektedir. Birçok araştırmada bu kişilerde kendine zarar verme davranışı ve intihar riskinin yüksek olduğu ortaya konmuştur. Dolayısıyla bu popülasyonda daha işlevsel baş etme yöntemlerinin kazandırılması, kendine zarar verme davranışının ve intihar girişiminin azaltılması yönünde müdahale çalışmalarına ihtiyaç duyulmaktadır. Bu müdahale çalışmalarının etkileri üzerine herhangi bir sistematik derlemeye rastlanılmamıştır. Borderline kişilik bozukluğu tanılı bireylerde kendine zarar verme ve intihar girişimini azaltmaya yönelik yapılan 2012-2022 yılları arasında yayınlanmış randomize kontrollü çalışmaları belirlemek için sistematik bir derleme yapılmıştır. Derlemede PsycARTICLES, Pubmed, Web of Science, Science Direct ve Taylor & Francis veri tabanları taranmıştır. Dahil etme ve dışlama kriterlerine göre başlangıçta 6760 çalışma taranmış ve sadece 13 çalışma derleme için seçilmiştir. Derleme sonucunda, standart Diyalektik Davranışçı Terapi protokolüne maruz bırakma, beceri eğitimi, kabul gibi psikolojik müdahale bileşenlerinin eklenmesinin iyileşmeyi istatistiksel olarak anlamlı derecede arttırdığı tespit edilmiştir. Şema Terapi, Bilişsel Davranışçı Terapi, Duygu Düzenleme Terapisi gibi çeşitli psikoterapotik müdahale gruplarından istatistiksel olarak anlamlı sonuçlarelde edildiği tespit edilmiştir. Ancak mevcut protokollerin, nüks önlemede ve terapiyi bırakma gibi olası olumsuz sonuçlarla başa çıkmada yetersiz kalabileceği belirtilmiştir.
Anahtar sözcükler: Borderline kişilik bozukluğu, kendine zarar verme davranışı, intihar, psikolojik müdahale

Introduction

Borderline personality disorder (BPD) is the most commonly observed personality disorder in psychiatric settings (Mohamadizadeh et al. 2017). BPD is a pattern observed in diverse contexts, emerging during early adulthood, and characterized by noticeable instability and impulsivity in interpersonal relationships, self-perception, and emotional expression (APA 2021). Individuals diagnosed with BPD often experience instability in emotions (Rizk et al. 2019), difficulty in emotion regulation (Martino et al. 2020, Chen et al. 2023), stress

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intolerance (Mattingley et al. 2022), dissociative symptoms (Fung et al. 2023), social and functional impairment (Gunderson et al. 2011), and while coping with these challenging situations, they tend to use maladaptive coping strategies. Among these maladaptive coping methods, suicide and non-suicidal self-injury are coping strategies that have a negative impact on an individual's life (Miller et al. 2007, Çelebi 2017).

Self-harm behaviour which is defined as the deliberate harm of body tissue by an individual without suicidal intent (Nock and Favazza 2009, APA 2021), is used as a response to pressure or as a means of relaxation in the face of stress (Aksoy and Ögel 2003). This dysfunctional coping mechanism is seen in many psychiatric disorders including dissociative identity disorder (Öztürk and Şar 2016), bipolar disorder and unipolar depression (Osby et al. 2001, Wang et al. 2021), borderline personality disorder (Andrewes et al. 2019), and anxiety disorders (Grant et al. 2023). However, because of the frequent occurrence of suicidal behaviour in patients with borderline personality disorder, at least three-quarters of these patients attempting suicide, and approximately 6-10 % of these attempts result in death (Black et al. 2004, Temes et al. 2019), the investigation of suicide attempts and self-harm behaviours in this diagnostic category is considered crucial. In addition to this, the frequency of non-suicidal self-injury, one of the most common dysfunctional behaviours in borderline personality disorder, has been reported to be between 60-76 % (Soloff 1994, Andrewes et al. 2019, Inigo and Marina 2021). Since self-harm behaviour is a factor that predicts suicide attempts (Klonsky and Glenn 2013) and suicide attempts result in death at a high rate, it is important to systematically examine the studies that are effective on this maladaptive coping method in terms of psychological interventions.

When the literature is examined, Dialectical Behaviour Therapy (Linehan et al. 2015, Lin et al. 2019), Schema Therapy (Mohamayanzadeh et al. 2017), Dialectical Behaviour Therapy with Long-Term Exposure (Harned et al. 2018), Conversation Therapy (Walton et al. 2020), and Cognitive Behavioural Therapy (Norrie et al. 2013) were proven by randomized controlled studies to be successful in reducing self-harm behaviour and preventing suicidal behaviour. Although there are intervention studies aimed at reducing self-harm behaviour and suicide seen in borderline personality disorder, no systematic review was found regarding what these intervention studies are and the effectiveness of these practices. In addition, when the literature was examined, although it was seen that there was a review of randomized controlled studies on borderline personality disorder (McLaughlin et al. 2019), there were no systematic reviews of randomized controlled studies specifically on self-harm behaviour and suicidal behaviour. Therefore, a gap in the literature has been identified in this field.

Furthermore, despite strong evidence in the literature that Dialectical Behaviour Therapy is statistically significant in the treatment of individuals with borderline personality disorder who are prone to suicide and self-harm behaviours (Linehan et al. 2015, Lin et al. 2019), the standard Dialectical Behaviour Therapy is recommended for the development of shorter and fewer resource-intensive treatments because the standard Dialectical Behaviour Therapy is costly in terms of time and resources (Chugani 2015, Murphy et al. 2020). Considering the high association of borderline personality disorder with self-harm, suicide attempts, and suicidal behaviour in adolescents and adults, intervention or preventive efforts in this field have become increasingly important. Systematic reviews are essantial because they comprehensively bring the literature on a specific topic to researchers' attention. Therefore, researchers who have the opportunity to examine the studies in this field comprehensively within a review will also gain a comprehensive understanding of how to develop effective treatment protocols.

This study aims to systematically identify randomized controlled studies aimed to reduce self-harm behaviour and suicide attempts in individuals diagnosed with borderline personality disorder, to examine the effectiveness of these interventions, and to explain which psychological component can be increased by changing this effect. Therefore, this study included a systematic review of randomized controlled studies conducted between 2012 and 2022 to reduce self-harm behaviour and suicide in people diagnosed with a borderline personality disorder.

Method

Screening and Selection Process

This study is a systematic review aimed at examining interventions and techniques to prevent self-harm behaviour, suicidal thoughts, and behaviours, and evaluating their effects in individuals diagnosed with borderline personality disorder. The review was conducted following the PRISMA 2020 guidelines. The literature review was conducted in PsycARTICLES, Pubmed, Web of Science, Science Direct and Taylor & Francis databases, covering 2012-2022. In the search, nine keywords, including “borderline personality disorder”, “bpd”, “self-harm”, “self-injury”, “self-destructive”, “suicide”, “intervention”, “treatment” and “therapy”, were coded and utilized ((‘borderline personality disorder’ OR ‘bpd’) AND (‘self?harm’ OR ‘self?injury’ OR ‘self?destructive’ OR

'suicid*')) AND ('intervention' OR 'treatment' OR 'therapy'). The same coding was also searched with their Turkish equivalents.

The inclusion and exclusion criteria for this systematic review were determined by the researchers. The inclusion criteria are randomized controlled studies on self-harm behaviour and suicidal ideation and behaviour seen in individuals diagnosed with borderline personality disorder, and the exclusion criteria are defined as review studies, case presentations, descriptive studies, and studies conducted with children or adolescent groups. As a result of the search, a total of 6760 studies were identified, with PsycArticles (55), Pubmed (736), Web of Science (1033), Science Direct (4929) and Taylor & Francis (7) being included. Following the reviews conducted within the framework of inclusion and exclusion criteria, 13 studies were identified (Figure 1).

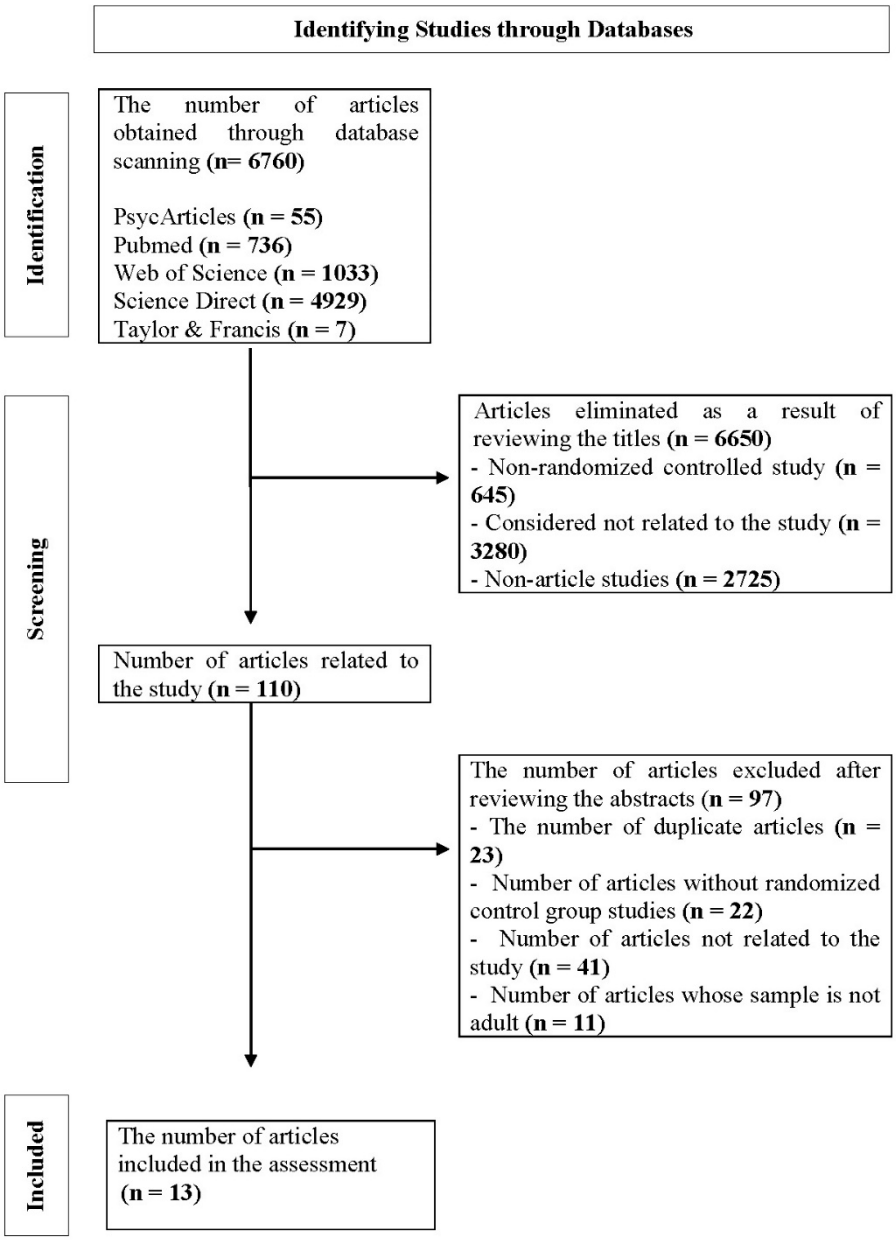

Figure 1. Flowchart outlining the selection of studies according to PRISMA criteria for a systematic review of interventions, techniques, and their effects on self-harm behaviour and suicide attempts and suicidal behaviour in individuals diagnosed with borderline personality disorder

Results

In this study, the keywords determined by the researchers were scanned in five databases and six thousand seven hundred and sixty (6760) studies were found. The retrieved studies were examined in the flowchart shown in Figure 1, and ultimately, thirteen randomized controlled research articles were included within the scope of the present study. The studies are grouped under the headings of "Sample Characteristics, Intervention/Techniques Used, Duration and Number of Measurements". They are shown in Table 1, and the measures used in the studies and the research results are shown in Table 2.

Table 1. General characteristics of studies

Study	Sample	Intervention/Technique Used and Treatment Duration	Number of Measurements
Harned et al. 2014	26 women between the ages of 18 and 60	In the study, one of the groups received standard DBT, which consists of one-hour individual therapy sessions once a week and 2.5 hours of group skills training for one year. In addition to standard DBT, the second group received a 90-minute long-term exposure protocol.	Four measurements were conducted, including measurements made at four-month intervals during the one-year treatment period and a follow-up measurement conducted three months after the end of treatment.
Krüger et al. 2014	34 women between the ages of 17 and 65	A standard DBT protocol was applied with exposure-based treatment for post-traumatic stress disorder for twelve weeks.	Measurements were conducted four times: pre-test, post-test, a follow-up after six weeks, and a follow-up after twelve weeks.
Lin et al. 2019	A total of 82 university students, 72 of whom are female and ten are male, aged 18 and above	In the study, one group received CBT, while the other received standard DBT. Groups consist of eight sessions, each lasting 120 minutes.	Measurements were conducted at pre-test and at weeks 4-8-12-20 and 32.
Linehan et al. 2015	99 women between the ages of 18 and 60	For one year, one of the groups in the study received standard DBT, another group received DBT (with skills training and case management components), and a third group received the Dialectical Behaviour Individual Therapy protocol.	Measurements were conducted three times: pre-test, post-test, and a follow-up after one year.
Gratz et al. 2015	61 women between the ages of 18 and 60	For 14 weeks, Emotional Regulation Group Therapy was applied.	Measurements were conducted three times: pre-test, post-test, and a follow-up after nine months.
Mohamadızadeh et al. 2017	36 women aged 18 and above	In the study, one of the groups received DBT, another group received Schema Therapy, and one group served as the control group. A total of 16 sessions were conducted over eight weeks, with each session lasting 90 minutes.	Measurements were conducted twice: pre-test and post-test.
Harned et al. 2018	38 women between the ages of 19 and 57	In the study, one of the groups received standard DBT, consisting of one-hour individual therapy sessions once a week and 2.5 hours of group skills training, for one year. In addition to standard DBT, the second group received a 90-minute long-term exposure protocol.	Measurements were conducted three times in total.
Walton et al. 2020	125 women and 37 men between the ages of 18 and 65	For 14 months, one of the groups received Dialectical Behaviour Therapy, while the other received the Conversation Model (CM) (a psychodynamic treatment developed for BPD). The DBT group received one individual session and one group session per week, whereas the CM group received two individual sessions per week.	Measurements were conducted three times: pre-test, mid-treatment, and post-test.

Andreoli et al. 2015	143 women and 27 men between the ages of 18 and 60	Abandonment Psychotherapy (a Cognitive/Psychodynamic intervention focusing specifically on abandonment experiences and fears) was performed for three months, twice a week.	Measurements were conducted twice: pre-test and a follow-up after three months.
McMain et al. 2018	154 women and 26 men between the ages of 18 and 60	Dialectical Behaviour Therapy was applied to one of the study groups, while the other group received GPM once a week for one year.	Measurements were conducted every four months during treatment and every six months for twelve years of follow-up.
Stratton et al. 2018	35 women and seven men aged 18 and above	Dialectical Behaviour Therapy Skills Training (mindfulness, emotion regulation, distress tolerance, interpersonal effectiveness, and dialectics) was conducted for 20 weeks, with two hours per week.	Measurements were conducted at the 5th, 10th, 15th, and 20th weeks. A follow-up test was conducted three months after the intervention was completed.
Krantz et al. 2018	66 women and 18 men between the ages of 18 and 60	Dialectical Behaviour Therapy (Acceptance added) was applied for twelve months with 20 sessions.	Pre-test and post-test measurements were conducted.

BPD: Borderline Personality Disorder, CBT: Cognitive Behavioural Therapy, CM: Conversation Model, DBT: Dialectical Behaviour Therapy, GPM: A predominantly psychodynamic individual treatment method that includes case management and pharmacotherapy

It was determined that the studies included in the review were published between 2013 and 2020, and the sample size ranged from a minimum of 26 (Andreoli et al. 2015) to a maximum of 170 (Harned et al. 2014) individuals. However, it was observed that the studies were generally conducted on female samples, designed to have at least eight sessions (Lin et al. 2019), held over a period ranging from three months to one year. In this context, at least two, including pre-tests and post-tests, and at most seven measurements were conducted. However, it was determined that Dialectical Behaviour Therapy was used as an intervention method in nine of the thirteen studies (Harned et al. 2014, Linehan et al. 2015, Mohamadızadeh et al. 2017, Harned et al. 2018, Krantz et al. 2018, McMain et al. 2018, Stratton et al. 2018, Lin et al. 2019, Walton et al. 2020). It was observed that in some of these ten studies, DBT was compared with another therapy method, and in some others, different components were added to the standard DBT protocol and compared with standard DBT..

Studies on the Effect of Dialectical Behaviour Therapy and Related Protocols on Reducing Suicide and Self-Harm Behaviour

Dialectical Behaviour Therapy (DBT) primarily treats risky behaviours and suicide attempts (Linehan and Wiilks 2015). DBT is an evidence-based therapeutic approach encompassesing dialectical philosophy, behavioural science, and Zen/meditation practices (Linehan and Wiilks 2015). Dialectical Behaviour Therapy, which aims to reduce suicidal behaviour and self-harm behaviour in individuals diagnosed with borderline personality disorder, consists of one hour of individual sessions per week, two and a half hours of group sessions per week, and a telephone coaching service that patients can reach whenever they need. In therapy, individuals with high suicidal tendencies or diagnosed with borderline personality disorder are taught new behavioural skills to solve their problems. Cognitive and behavioural interventions such as behaviour analysis, exposure, skills training, and cognitive structuring are covered. DBT skills training consists of four skill components: increasing conscious awareness, gaining more effective interpersonal relationship skills, increasing emotion regulation skills, and increasing tolerance to distress (Linehan et al. 2015). When the dimensions added to the DBT protocol were examined, it was determined that the long-term exposure protocol was added to the standard DBT protocol, and its effectiveness was examined in three studies (Harned et al. 2014, Krüger et al. 2014, Harned et al. 2018). The first of these studies (Harned et al. 2014) was conducted with a sample of women diagnosed with Borderline Personality Disorder (BPD) who also exhibited PTSD and self-harm behaviours and aimed to measure the effectiveness of adding trauma treatment to the Dialectical Behaviour Therapy (DBT) protocol. For this reason, while the standard DBT protocol was applied to one of the groups in the study (n = 9), a 90-minute long-term exposure protocol was performed on the other group (n = 17) in addition to the standard DBT protocol. During the treatment, measurements were conducted every four months to measure the effect, and the continuity of the effect was measured three months after the treatment. As a result of all these measurements, it was determined that the second group, which completed the DBT protocol with long-term exposure, was 2.4 times less likely to attempt suicide, and their probability of self-harm was 1.5% fewer than the first group that received only DBT (Harned et al. 2014). Similarly, in another study (Harned et al. 2018) in which long-term exposure was performed with standard DBT and its effectiveness was compared with standard DBT, adding the exposure

protocol to the standard DBT protocol resulted in statistically significant outcomes in terms of PTSD severity, BPD severity, impulsivity in problematic behaviours, and overall well-being. Finally, in a study involving 34 female participants, the classic DBT protocol performed with exposure-based trauma-focused treatment for twelve weeks, it was found that 62 % of the participants exhibited non-suicidal self-injury before treatment but this rate decreased to 38 % after treatment (Krüger et al. 2014).

When studies were examined in terms of the dimensions added to the standard DBT protocol, in one study, participants (n = 99) were randomly assigned to three groups: standard DBT, DBT with Skills Training and Case Management components (DBT-S), and Dialectical Behaviour Individual Therapy (DBT-I) (Linehan et al. 2015). For the effectiveness of the study, measurements were conducted three times: pre-test, post-test, and one year follow-up test. The research findings revealed improvement in all three protocols; however, groups that received DBT with Skills Training and Case Management components and the standard DBT protocols showed more recovery in terms of non-suicidal self-injury and depression compared to groups that received DBT with individual therapy sessions at the end of the treatment. Additionally, while there was a recovery in anxiety at the end of the treatment in the DBT-S and DBT groups, no improvement was observed in the DBT-I group (Linehan et al. 2015). In another study, this time, unlike the previous ones, a 20-session protocol was performed, with acceptance added to the standard DBT protocol (Krantz et al. 2018). As a result of the study, it was determined that DBT skills training had a significant effect on non-suicidal self-injury and that the significant relationship between DBT skills training and change in non-suicidal self-injury was mediated by acceptance without judgment. In summary, compared to standard DBT, DBT with the addition of exposure (Harned et al. 2014, Harned et al. 2018), DBT with the addition of the acceptance component (Krantz et al. 2018), and DBT with the addition of skill training and case management components (Linehan et al. 2015) were found to provide statistically significant results.

Studies on the Effect of Emotion Regulation Therapy on Suicide and Self-Harm Behaviour

In addition to Dialectical Behaviour Therapy, it was determined that Emotion Regulation Therapy was used in two of the studies examined in the review (Gratz et al. 2013, Gratz et al. 2015). Emotion Regulation Therapy is based on three core skills: positive or negative experience of all emotions flexibly, ability to recognize emotions, and acceptance of emotions (Gratz and Tull 2010). The Emotion Regulation Group Therapy, which lasted for 14 weeks, was conducted once a week and limited to six participants. It was generated using Acceptance and Commitment Therapy and Dialectical Behaviour Therapy methods. Emotion Regulation Therapy aims to help clients acquire the skills of effectively recognizing and accepting emotions. The individuals are taught the ability to maintain goal-directed behaviours instead of reacting impulsively even when they experience negative emotions (Gratz et al. 2013).

In the investigation conducted by Gratz et al. (2015), it was ascertained that a noteworthy factor contributing to the reduction of cognitive and affective symptoms associated with borderline personality disorder throughout the course of treatment was the amelioration of emotion regulation. Similarly, a study conducted by Gratz et al. (2013) established significant therapeutic outcomes associated with Emotion Regulation Therapy, which encompassed ameliorations in self-harming behaviors, emotional dysregulation, symptoms of borderline personality disorder, depression, stress-related symptoms, and enhancements in overall quality of life. It is notable that both of these studies were devoid of a control group for comparison purposes.

Studies on the Effects of Other Therapy Approaches on Suicide and Self-Harm Behaviour Compared to Dialectical Behaviour Therapy

Within the scope of the review, studies were found comparing DBT with Cognitive Behavioural Therapy (CBT), Schema Therapy, and Conversation Therapy. CBT consists of two basic components: cognition and behaviour (Özdel 2015). The therapy process is an evidence-based therapy consisting of assessment, psycho-education, cognitive and behavioural interventions, and relapse prevention (Türkçapar 2018). Cognitive Behavioural Group Therapy, which aims to reduce suicidal behaviour and self-harm behaviour in individuals diagnosed with borderline personality disorder, consists of 120-minute sessions once a week for eight weeks. These sessions consist of three parts: psycho-education, cognitive interventions, and behavioural interventions. Participants are first introduced to the cognitive model of depression and suicide. Then, the two-way interaction between thought and emotion is discussed. Automatic thoughts are introduced as cognitive interventions. Participants are encouraged to recognize their dysfunctional automatic thoughts. Dysfunctional automatic thoughts are questioned with various cognitive methods and replaced with more functional and realistic automatic thoughts. Then, dysfunctional assumptions and core beliefs are determined using the down arrow technique. The

advantages and disadvantages of assumptions are discussed. In the behavioural part of the intervention, participants are taught relaxation techniques (Lin et al. 2019).

Schema therapy was initially developed to treat personality disorders (Martin and Young, 2010). However, it was later shown to be effective in various areas. Schema therapy is recommended if the person has long-term relationship problems, maintains rigid thought and behaviour patterns, or if the issue the person experiences continues chronically (Martin and Young 2010). Schema therapy is based on three fundamental constructs: schemas, coping styles, and modes (Martin and Young 2010). Schema Group Therapy, which aims to reduce suicidal and self-harm behaviour in individuals diagnosed with borderline personality disorder, consists of sixteen sessions of 90 minutes total for eight weeks. Sessions begin by introducing group therapy and interviewing participants. It then continues with pre-test studies and homework prepared using cognitive techniques. Then, depending on the type of schema, "mental imagery", "limited parenting", and "talking" techniques, in which unmet emotional needs in childhood are identified, are used. In the later stages of the intervention, imagination is used regarding the vicious circles that arise from people's schemas but are problematic. Relationships with essential people are discussed, and role plays are performed regarding these relationships. Finally, it ends with the post-testing studies (Mohamadızadeh et al. 2017).

Table 2. Measures used in the studies and study results

Study	Measures	Study Results
Harned et al. 2014	IPDE PSS-I SCID-I TLEQ 3-CEQ	Clients who completed the DBT protocol with long-term exposure (Group 1) were 2.4 times less likely to attempt suicide and 1.5% less likely to self-harm than clients who only received DBT (Group 2). When the groups were examined in terms of anxiety, a statistically significant decrease was determined in the anxiety scores of Group 1 (β = −3.0, t (54) = 4.6, p < .001). Although there was a decrease in the anxiety score of Group 2, no statistically significant differences were noted (β = −2.0, t (54) = 1.9, p = .06). While a significant decrease in PTSD severity was found in both groups (g's > 1.2), the most significant effect was observed in Group 1 (g = 2.9). When the groups were examined after treatment in terms of secondary outcomes such as dissociation, trauma-related guilt cognitions, shame, anxiety, depression and global severity, it was determined that the inter-group effect sizes were very large in favour of Group 1 among those who completed the treatment (average g = 1.1, range = 0.7-1.4).
Krüger et al. 2014	SCID-I IPDE SBD-I CAPS PDS BDI-II SCL-90-R BSL-23 DES	Non-suicidal self-injury, which was 62% before treatment, decreased to 38% after treatment. Participants who showed non-suicidal self-injury before treatment reported a statistically significantly stronger urge during exposure and non-exposure treatment phases than participants who did not show non-suicidal self-injury before treatment (p = .03 for both comparisons). It was concluded that whether the person had non-suicidal self-injury before treatment did not predict the effect of current exposure treatment on PTSD symptoms (F (8,25) = .807, p = .603).
Lin et al. 2019	CMSADS-L SCID-I BPDFS KDI ASIQ-S CEQ-S ERS	Group × time effects on suicide attempts were not statistically significant (p > .05). However, the main effect of time on suicide attempts was statistically significant at week 4 (β = -.59, p < .01) and week 8 (β = -.42, p < .01), week 20 (β = -.33, p < .01), and week 32 (β = -.25, p < .01) of the intervention. Moreover, a statistically significant increase in cognitive reappraisal was noted for CBT group (20 Weeks: β = −.89, p < .05; 32 Weeks: β = −.67, p < .05), a statistically significant decrease in cognitive errors was noticed (4 Weeks: β = 11.51, p < .01; 8 Weeks: β = −5.77, p < .01; 20 Weeks: β = 2.71, p < .01; 32 Weeks: β = 1.21, p<.01). For DBT group, a statistically significant increase in acceptance (8 Weeks: β = −3.46, p < .01; 20 Weeks: β = −2.10, p < .01; 32 Weeks: β = −1.32, p < .01) and a statistically significant decrease in suppression were found (20 Weeks: β = .46, p < .01; 32 Weeks: β = .42, p < .01).
Linehan et al. 2015	SAS-II SBQ RLI THI HAM-D HAM-A	A decrease in non-suicidal self-injury was determined in three groups treated with three protocols: DBT, DBT-S and DBT-I. However, it was determined that self-harm behaviour without suicidal intent was statistically significantly higher at the end of the treatment in the DBT-I group compared to the DBT-S (F (1,85) = 56.3, p < .001) and DBT group

		F (1,85) = 59.1, *p* < .001). Additionally, the DBT-I group showed a statistically significantly lower decrease in depression at the end of the treatment compared to the DBT-S (t (399) = 2.9, *p* = .004) and DBT group (t (399) = 1.8, *p* = .03). Besides, at the end of the treatment, a statistically significant improvement in anxiety was observed in the DBT-S (*t* (94) = -2.6, *p* = .01) and DBT group (*t* (94) = -3.5, *p* < .001) compared to the pre-treatment period, and while no improvement was observed in the DBT-I group (*t* (94) = -0.8, *p* = .42). No statistically significant differences were found between the groups in terms of anxiety change.
Gratz et al. 2015	DIPD SCID-I LPC DBI THI DERS ZAN-BPD	Improvements in emotion regulation during treatment mediated the observed reductions in cognitive (*b* = –.32, *SE* = .14, % 95 GA [–.65, –.09]) and affective symptoms (*b* = –.21, *SE* = .10, % 95 GA [–.43, –.04]) of borderline personality disorder during treatment. In follow-up measurements, it was determined that the change in emotional regulation during the treatment significantly predicted the change in deliberate self-harm (*β* = .32, *p* < .05). The change in cognitive and affective symptoms of borderline personality disorder were not statistically significant predictors of the change in deliberate self-harm (respectively *βs* =. 10 ve .23; *ps* > .10).
Mohamadızadeh et al. 2017	MCMI BDI SSI	While there were no significant differences between the effect of DBT and Schema therapy on suicidal ideation (*t* = 1.396, *p* = .663), a significant difference was noticed in favour of schema therapy on mood activities (*t* = 3.034, *p* = .006).
Harned et al. 2018	IPDE PTSD-SS SCID-I SAS-II PCL-C BSL DSS	By adding the exposure protocol to the standard DBT protocol, better results were obtained in terms of PTSD severity (*t* (537) = 1.54, *p* = .12, *d* = 0.50) and BPD severity (*t* (551) = 1.62, *p* = .11, *d* = 0.52). In addition, compared to the standard DBT group, statistically significant better results were obtained in terms of the urge to engage in problematic behaviour (*t* (977) = 2.18, *p* = .03, *d* = 0.71) and general well-being (*t* (551) = –2.84, *p* < .01, *d* = –0.92) for DBT group with added exposure.
Walton et al. 2020	The SASI-Count BDI-II BPDSI-IV IIP DES SSI KIMS DERS	No significant differences were noticed between treatment models in reducing suicidal and non-suicidal self-injury (*p* = .714). However, DBT was associated with significantly more reductions in depression scores compared to the Conversation model (Wald's $\chi 2$ = 8.00, *p* = 0.005). When group and time interaction were examined, no statistically significant differences were noticed between DBT and the Conversation model regarding BPD severity, interpersonal problems and change in dissociation (respectively *p* = .445, *p* = .130, *p* = .946). However, compared to the Conversation model, the DBT group showed a statistically significant improvement in mindfulness skills (Wald's $\chi 2$ = 8.16, *p* = 0.004) and emotion regulation skills (Wald's $\chi 2$ = 7.04, *p* = 0.008).
Andreoli et al. 2015	SCID-I/P IPDE GAS HDRS-17 CGI HSRS SCID-III-P	The study compared three methods: Treatment as usual (TAU), Abandonment Psychotherapy applied by psychotherapists, and Abandonment Treatment performed by nurses. Regarding suicide relapse, the group receiving abandonment psychotherapy administered by psychotherapists experienced fewer relapses than those receiving treatment as usual ($\chi 2$ = 8.09, *p* = .004). Regarding suicide relapse, the group receiving abandonment psychotherapy administered by nurses had fewer relapses than those receiving treatment as usual ($\chi 2$ = 9.33, *p* = .002). Regarding suicidal ideation, the group receiving abandonment psychotherapy administered by psychotherapists demonstrated more improvement than those receiving classical treatment (*t* = 2.84, *p* = .007). Regarding suicidal ideation, the group receiving abandonment psychotherapy administered by nurses showed more improvement than those receiving classical treatment (*t* = 3.44, *p* = .002). However, no significant difference was noticed between the group in which therapy nurses administered and the group in which therapists administered therapy.
McMain et al. 2018	SCID I IPDE SAS-II ZAN-BPD STAXI BDI-II SCL-90-R	A study comparing DBT and classic therapy indicated that most individuals responded positively to both treatments. Then, individuals were grouped according to their response to treatment and three subgroups were identified: "Rapid and recovered", "Slow and recovered" and "Recovered and relapsed". 84.7 % of the participants were classified as Rapid and recovered, 8.6 % as Slow and recovered, and 6.8 % as Recovered and relapsed.

	THI	
Stratton et al. 2018	SCID-I/P L-SASI BIS-11 DBT-WCCL STAXI BECK-II GSRS KIMS	Regression model established with lower education level, number of Axis I diagnoses, higher lifetime suicide attempts, and receiving disability pension was not statistically significant (Hosmer-Lemeshow test, $\chi 2$ (30) = 30.54, p = .44). Only the receiving disability pension statistically significant predicts the tendency to give up treatment *OR* = 5.87, % 95 GA [1.03, 33.43]). In the second stage of the study, the change in self-esteem skills after treatment predicted the tendency to drop out of treatment (*OR* = 0.95, % 95 GA [0.91, .99]).
Krantz et al. 2018	IPDE-BPD SCID-I/P L-SASII KIMS BSL-23 BDI-II	DBT skills training was found to have a significant effect on non-suicidal self-injury (β = −1.22, z = 2.21 p = .04). DBT skills training was found to have a statistically significant impact on acceptance without judgment compared to the waiting list (β = 3.83, t = 2.28, p = .03). Significant relationship between DBT skills training and change in non-suicidal self-injury was mediated by non-judgmental acceptance (Indirect effect = −12.85, 95% GA [−51.27, −0.45]).
Gratz et al. 2013	DIPD-IV SCID-I/P LPC DSHI THI TCS DBI SHI ZAN-BPD BEST BDI-II DASS IIP-BPD SDS QOLI DERS AAQ	Emotion Regulation Therapy has statistically significant effects on self-harm behaviour (Cohen's d's = .64), difficulty in emotional regulation (Cohen's d's = .55), BPD symptoms (Cohen's d's= 1.20), depression (Cohen's d's= .51), stress symptoms (Cohen's d's= .60) and quality of life (Cohen's d's= .52).

3-CEQ: The 3-item Childhood Experiences Questionnaire, AAQ: The Acceptance and Action Questionnaire, ASIQ-S: Adult Suicidal Ideation Questionnaire Shortened Version, BDI: Beck Depression Inventory, BDI-II: Beck Depression Inventory II, BEST: The Borderline Evaluation of Severity Over Time, BIS-11: The Barratt Impulsiveness Scale-11, BPD: Borderline Personality Disorder, BPDFS: Borderline Personality Disorder Feature Scale, BPDSI-IV: Borderline Personality Disorder Severity Index, BSL: Borderline Symptom List, BSL-23: Borderline Symptom List-23, CAPS: Administered PTSD Scale, CBT: Cognitive Behavioural Therapy, CEQ-S: The Cognitive Error Questionnaire-Shortened Version, CGI: The Clinical Global Impression, CMSADS-L: Chinese version of the Modified Schedule of Affective Disorders and Schizophrenia-Lifetime Short Form, DASS: Depression Anxiety Stress Scale, DBI: The Deliberate Self-harm Inventory, DBT: Dialectical Behaviour Therapy, DBT-WCCL: DBT Ways of Coping Check List, DBT-I: Adding the Dialectical Behaviour Individual Therapy protocol to the Standard Dialectical Behaviour Therapy, DBT-S: Adding Skills training and Case Management components to Standard Dialectical Behaviour Therapy, DERS: The Difficulties in Emotion Regulation Scale, DES: Dissociative Experiences Scale, DIPD: Diagnostic Interview for DSM-IV Personality Disorders, DIPD-IV: The Diagnostic Interview for DSM-IV Personality Disorders, DSHI: The Deliberate Self-harm Inventory, DSS: Dissociative State Scale, ERS: Emotion Regulation Scale, GAS: The Global Assessment Scale, GSRS: The Group Session Rating Scale, HAM-A: Hamilton Rating Scale For Anxiety, HAM-D: Hamilton Rating Scale For Depression, HDRS-17: The Hamilton Depression Rating Scale 17 items, HSRS: A modified version of the Health Sickness Rating Scale, IIP: Inventory of Interpersonal Problems, IIP-BPD: The Inventory of Interpersonal Problems, IPDE: The International Personality Disorder Examination, IPDE-BPD: The International Personality Disorder Exam- BPD Module, KDI: Ko's Depression Inventory, KIMS: Kentucky Inventory of Mindfulness Skills,LPC: Lifetime Parasuicide Count, L-SASI: Lifetime Suicide Attempts, L-SASII: The Lifetime Suicide Attempt Self-Injury Interview, MCMI: The Millon Clinical Multiaxial Inventory, PCL-C: The 17-item PCL-C, PDS: Selfrating Posttraumatic Diagnostic Scale, PSS-I: The PTSD Symptom Scale-Interview, PTSD: Post Traumatic Stress Disorder, PTSD-SS: The DSM-IV version of the PTSD Symptom Scale – Interview, QOLI: The Quality of Life Inventory, RLI: Reasons for Living Inventory, SAS-II: The Suicide Attempt Self-Injury Interview, SBD-I: The Severe Behaviour Dyscontrol Interview Clinician, SBQ: The Suicidal Behaviours Questionnaire, SCID-I: The Structured Clinical Interview for DSM-IV, Axis I, SCID-I/P: The Structured Clinical Interview for DSM-IV Axis I Disorders – Patient Edition, SCID-III-P: The SCID-III-P interview, SCL-90-R: Symptom Checklist-90- Revised, SDS: The Sheehan Diability Scale, SHI: The Self-harm Inventory, SSI: The Scale for Suicide Ideation of Mach, SSI: Sense of Self Inventory, STAXI: The State-Trait Anger Inventory, TAU: Treatment As Usual, TCS: The Credibility/Expectancy Scales, The SASI-Count: The SASI-Count, THI: Treatment History Interview, TLEQ: The Traumatic Life Events Questionnaire, ZAN-BPD: The Zanarini Rating Scale for Borderline Personality Disorder r

When the studies comparing DBT with other therapy approaches are examined, the contribution of DBT to reducing depression and suicide attempts is compared to CBT. DBT shows more improvement in the six-month follow-up than CBT and more recoveries in cognitive reappraisal, and cognitive errors are obtained with CBT. At the same time, DBT was found to show a greater increase in acceptance and a decrease in suppression (Lin et al. 2019). In another study, while there was no significant difference in the effect of DBT and Schema Therapy on suicidal ideation, it was found that there was a significant difference in favour of Schema Therapy on mood-

related activity (Mohamadızadeh et al. 2017). When DBT and Conversation Therapy were compared, no significant difference was found between the treatment models in reducing suicidal and non-suicidal self-injury. However, DBT was associated with significantly greater reductions in depression scores compared to the Conversation Model (Walton et al. 2020). Abandonment Psychotherapy (Andreoli et al. 2015) was found to have a positive effect on reducing self-harm behaviour and preventing suicidal thoughts and behaviours.

Additionally, although DBT provided statistically significant improvement, a slight relapse occurred for a small group of participants (McMain et al. 2017). Therefore, there seems to be a need for an intervention component aimed at relapse prevention. When the studies were examined in terms of the sample, the sample of seven studies consisted of only female participants, (Gratz et al. 2013, Harned et al. 2014, Krüger et al. 2014, Linehan et al. 2015, Gratz et al. 2015, Mohamadızah et al. 2017, Harned et al. 2018). It was observed that the sample of six studies consisted of both male and female participants (Andreoli et al. 2015, McMain et al. 2018, Krantz et al. 2018, Stratton et al. 2018, Lin et al. 2019, Walton et al. 2020). When the studies were evaluated based on their publication year, it was seen that group studies with only female participants were conducted between 2013-2018, and group studies with both female and male participants were conducted between 2015-2020. In more recent group studies, it has been observed that both male and female participants are selected together as a sample. The measures used in the studies and the research results are shown in Table 2.

Upon scrutinizing the tabulated data, a prevalent trend emerged, indicating that the preeminent instrument employed for measurement across the surveyed studies was the Structured Clinical Interview for DSM Disorders (SCID-I) (First et al., 1995). SCID-I, renowned for its wide utilization as a diagnostic tool conforming to the criteria set forth in the Diagnostic and Statistical Manual of Mental Disorders (DSM), emerged as the preferred assessment method. A closer inspection revealed that, out of the 13 studies encompassed within the review, the SCID-I, a semi-structured interview administered by qualified clinicians, was adopted for diagnostic evaluations in 10 of them. Furthermore, it was discerned that the Beck Depression Inventory (Beck et al., 1996) was employed in conjunction with the SCID-I in 7 of the aforementioned studies.

Discussion

This systematic review sought answers to questions about what the interventions and techniques are to prevent self-harm behaviour, suicidal thoughts, and behaviour in individuals diagnosed with borderline personality disorder, whether they are effective or not, and what the components of the intervention should be. Thirteen studies were included within the scope of the review. Randomized controlled trials are considered the ultimate research method to observe the effectiveness of treatments (Carey and Stiles 2016). All studies examined within the extent of this review are randomized controlled studies. Due to the absence of any previous studies that systematically reviewed interventions to prevent self-harm behaviour, suicidal thoughts, and behaviour in individuals diagnosed with borderline personality disorder, the current study will contribute to the literature. Moreover, it is thought that a detailed examination of studies on preventing risky behaviours for human life, such as self-harm behaviour and suicide attempts, will also shed light on the effective design of psychological interventions in this field.

As this review study reveals, DBT, CBT, Schema Therapy, Emotion Regulation Therapy, Conversation Therapy, and Abandonment Psychotherapy statistically significantly reduce the current problem. There are points where these interventions are similar and superior to each other in effectiveness. For example, no difference was found in post-tests regarding the effect of DBT compared to CBT on reducing depression and suicide attempts. However, when the six-month follow-up tests were examined, it was determined that the DBT group provided a statistically significant decrease in depression and suicide attempts compared to the CBT group (Lin et al. 2019). Therefore, it can be said that DBT is superior to CBT regarding the permanence of recovery. Additionally, DBT was associated with statistically significantly more reductions in depression scores compared to the Conversation Model (Walton et al. 2020). Therefore, it can be said that DBT is statistically more effective than both CBT and the Conversation model, especially in terms of depression scores. On the other hand, CBT, which is based on the principle that the individual's cognitive processes have an impact on his/her psychological reactions as it includes intervention in cognitions (Türkçapar and Sargın 2012), can be expected to show more development, especially in cognitive areas, compared to other therapy groups. In the study of Lin et al. (2019), it was found that the CBT group showed a statistically significant improvement in terms of cognitive reappraisal and cognitive errors. However, a statistically significant increase in emotional acceptance and a statistically significant decrease in emotional suppression were found in the DBT group compared to the CBT group (Lin et al. 2019). Regulating emotions can be significant in borderline personality disorder, whose diagnostic criteria include affective inconsistency (APA 2021). Emotion regulation is primarily a skill in which the individual

recognizes the emotion experienced at that moment, accepts feelings, and gives room to experience them, regardless of the emotion (Gratz and Roemer 2004). Although emotion regulation therapy stands out as a treatment method that provides a statistically significant decrease in the suicide attempt and self-harm behaviour of individuals diagnosed with borderline personality disorder (Gratz et al. 2013, Gratz et al. 2015), due to the lack of comparative studies with other therapy methods, it is not possible to reach a definitive conclusion about its superiority over any other therapy. Therefore, more research is needed in this area. Moreover, in the study by Lin et al. (2019), in which they compared the changes in the CBT and DBT groups, an increase in emotional acceptance and a decrease in emotion suppression were determined in the DBT group. It is thought that emotion regulation therapy may have mutual components such as emotional acceptance and experiencing emotions flexibly with DBT (Gratz and Roemer 2004). More research is needed to determine the superiority of these two therapy approaches in their effects on emotion regulation and management. Although present studies examine the effectiveness of interventions, it was determined that studies revealing which mediator variable this effect occurs through are limited (Gratz et al. 2015, Krantz et al. 2018). When planning an intervention study, studies are needed on mediating variables to consider the effective mechanism as a component of the intervention. Thus, the effect of the intervention can be increased, and possible relapses can be prevented.

In the studies examined within the scope of the review, it was observed that the intervention groups usually consisted of only women (Gratz et al. 2013, Harned et al. 2014, Krüger et al. 2014, Linehan et al. 2015, Gratz et al. 2015, Mohamadızah et al. 2017, Harned et al. 2018). In studies involving male participants, it was determined that men were fewer in number than women (Andreoli et al. 2015, Krantz et al. 2018, McMain et al. 2018, Stratton et al. 2018, Lin et al. 2019, Walton et al. 2020). It is thought that this situation may be caused approximately 75% of borderline personality disorders being diagnosed in women (APA, 2013). Besides, the underlying reasons why male participants attend fewer in such group therapies can also be investigated. Therefore, it is significant to find an answer to these questions in future research because men may also be diagnosed with borderline personality disorder and have similar risks. Male participants also need such intervention studies and research should be conducted in this direction. Therefore, it is important to consider gender distribution in a more balanced manner in future studies. Additionally, it was determined that the studies did not examine potential differences between genders in terms of benefiting from the intervention and maintaining this positive effect. Investigating these differences and creating appropriate intervention components and protocols according to gender is significant to obtain statistically significant results.

It is significant to consider using individual and group sessions in therapy protocols. In the study by Walton et al. (2020), the DBT treatment protocol was performed in one group, and the CM (a talk-based psychodynamic treatment developed for BPD) treatment protocol was applied to the other group. While the DBT group received one individual session per week and one group session per week, the CM group received two individual sessions per week. According to the study, DBT was associated with significantly more reductions in depression scores compared to the Conversation Model (Walton et al. 2020). In other words, it can be said that individual sessions held twice a week do not have a positive effect compared to the group sessions. However, additional research is needed to obtain more definitive results since other factors may impact this result, such as differences due to using different therapy methods.

An additional salient aspect warranting consideration in the evaluation of intervention studies pertains to the implementation of follow-up assessments. In several studies encompassed within the purview of this review, an absence of follow-up evaluations was noted. The omission of such post-intervention follow-up assessments introduces an inherent limitation, as it hinders the capacity to draw definitive conclusions regarding the enduring efficacy of the intervention. Consequently, follow-up evaluations assume a pivotal role in gauging the sustained effectiveness of the treatment over the long term. Thus, it is postulated that the incorporation of follow-up assessments subsequent to the intervention, at intervals such as six months, one year, or two years, stands as a crucial facet in ascertaining the durability of the intervention's impact. Researchers embarking on the planning of intervention studies would be well-advised to contemplate these temporal measurement points during the formulation of the intervention period.

The duration of the intervention protocol is an important point that can be discussed. It is significant that the duration is not so short that it negatively affects the treatment. On the other hand, short-term protocols may be needed to reduce costs and speed up the treatment process. In this review, since no comparison was made within the same study in terms of duration in the studies examined, no conclusion can be drawn as to which treatment protocol provides shorter or more statistically significant results. However, among the studies examined, it is seen that the DBT protocol (Harned et al. 2014, Linehan et al. 2015) lasts approximately one

year, while Emotion Regulation Therapy (Gratz et al. 2013, Gratz et al. 2015) is a 14-week and it is an effective protocol. It would be beneficial to conduct a study comparing the DBT protocol and Emotion Regulation Therapy or other short-term group treatments and compare these protocols in terms of both effectiveness and duration.

In addition, as seen in this systematic review, no studies were found in the Turkish sample to reduce self-harm behaviour and suicide attempts noticed in individuals diagnosed with borderline personality disorder. When the literature is examined, although there are descriptive studies examining the factors that predict self-harm behaviour and suicide attempts in individuals diagnosed with borderline personality disorder (Küçük and Çetinkaya 2019, Tunç ve Şahin 2019), the absence of any intervention studies shows that there is a critical gap in this field.

Conclusion

When reviewing the literature, although reviews related to BPD are encountered, no study compiling randomized controlled trials on suicide attempts and self-harm behaviours has been found. This gap shows that the current review will contribute to the literature in this field. The present review is significant in providing a general overview and evaluation of treatment methods in this field. Another strength of the present study is that it includes studies from 2012 onwards and presents up-to-date research findings comprehensively. Although individuals diagnosed with borderline personality disorder resort to self-harm behaviour and suicide attempt as a coping method, these actions cause critical problems in the individuals' lives. The current review results are significant as they show that the situations that cause this serious problem can be reduced with psychotherapy, and individuals can be provided with more functional coping methods.

DBT, developed for treating borderline personality disorder, has both advantageous and disadvantageous effects on the current problem. Following the reviews, it was found that standard Dialectical Behaviour Therapy (DBT) significantly reduced suicidal and self-harm behaviours, but the persistency of this effect was statistically lower compared to the protocol that included exposure as a component (Harned et al. 2014, Harned et al. 2018). Therefore, it can be said that adding exposure as a psychological intervention component to the standard DBT protocol can increase the efficacy of the therapy process. Similarly, it has been observed that DBT (Krantz et al. 2018), with the acceptance component, and DBT (Linehan et al. 2015), with various psychological components such as skill training and case management, can provide statistically significant results. Therefore, treating these components in the therapy process can positively affect recovery. Additionally, the standard DBT protocol was found to have a statistically weaker regarding cognitive domains compared to CBT. In addition, the DBT protocol is advantageous because it provides a statistically significant increase in the components of emotional acceptance and permission to experience emotions, which are essential in the face of the current problem. Therefore, the present study will guide researchers who will develop an intervention program by showing these advantages and disadvantages, the content, process and intervention results of previous interventions.

In summary, the systematic review underscores the importance of enhancing existing therapeutic protocols for individuals diagnosed with borderline personality disorder, particularly in the context of reducing self-harming behaviors and suicide attempts, as evidenced by randomized controlled studies. This necessitates a heightened focus on strategies pertaining to relapse prevention and treatment continuity. Furthermore, the review highlights a notable gap in the literature pertaining to randomized controlled studies addressing suicide and self-harm behavior, prevalent issues within individuals diagnosed with Borderline Personality Disorder in Türkiye. Hence, it underscores the urgent need for intervention studies to address these critical areas of concern.

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