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Comparison of Different Therapies on Reducing Self-Injury Behaviors in PTSD Veterans

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ABSTRACT

Aims The present study was conducted to investigate the effectiveness of DBT-PE combined treatment protocol, dialectical behavior therapy, and prolonged exposure therapy in reducing self-injury behaviors of veterans with PTSD.

Materials & Methods This experimental study was conducted with a pre-test/post-test design with a control group and a follow-up. The statistical population of the research was made up of all veterans with PTSD who were referred to Isar Psychiatric Hospital in Ardabil, Iran, in 2022. The research sample consisted of 80 veterans with PTSD, who were selected from the statistical population as a purposeful sampling, considering the acceptance of veterans to participate in the research in the first place and having the entry criteria. To collect data, the Inventory of Statements about Self-injury was used. The first experimental group received DBT (10 sessions of 90 minutes), the second experimental group received PE (10 sessions of 90 minutes), and the third experimental group received DBT-PE (16 sessions of 90 to 120 minutes).

Findings All three intervention methods were effective in reducing self-injury behaviors of veterans with PTSD ($p<0.01$); However, the effect of combined treatment was greater than the other two interventions ($p<0.05$).

Conclusion The combined treatment method has a greater effect in reducing self-injury behaviors in veterans with PTSD compared to prolonged exposure therapy and dialectical behavior therapy. Also, prolonged exposure therapy has a greater effect than dialectical behavior therapy.

Keywords Veteran; Self-Injury Behavior; Dialectical Behavior; Exposure Therapy

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Introduction

The war between Iraq and Iran has caused irreparable economic, physical, and psychological damage. Threats to mental health and post-traumatic stress disorder (PTSD) are examples of psychological damage [1]. Post-traumatic stress disorder often causes a person to feel fear, disorder, helplessness, or panic after observing or experiencing a traumatic event [2]. This disorder includes three categories of complex, chronic, and unique symptoms. These symptoms are (1) re-experiencing injury-related memories, (2) avoiding situations that remind one of the injury, and (3) emotional numbness and hyperarousal, such as irritability, reduced concentration, and exaggerated reactions [3]. Studies conducted in the clinical field to investigate the prolonged effects of war on the psycho-social status of veterans have indicated that the passage of time, increasing age, and the lack of comprehensive treatment can exacerbate the symptoms and problems of these people [4]. The prevalence of this disease in the general population is estimated at 1-9% [3]. Studies have indicated that 51% of veterans suffer from PTSD, the severity of which varies from mild to very severe [5].

An increase in self-injury behaviors has been observed among military populations in recent decades. Self-injury behaviors are among the psychosocial problems resulting in damage to the body tissues of the self-injury person. After performing self-injury behaviors, a person feels calm at first. However, he gradually faces a feeling of guilt and shame, and this feeling is associated with many psychological and social consequences for the person [6].

The goal of these behaviors is generally to reduce or get rid of negative emotions and self-punishment and to reduce numbness or dissociative experiences [7]. The prevalence of self-injury behaviors among young soldiers in military institutions is estimated at between 4% and 28%, which is higher than that in the general population. Depressive disorders, post-traumatic stress disorder, and borderline personality disorder are associated with self-injury behaviors in military soldiers [8]. Dehghani Neyshabouri *et al.* [9] showed that PTSD symptoms are a positive predictor of self-injury behaviors. They also showed that increasing rumination and reducing social support can have direct and indirect impacts on the rate of self-injury behaviors. Additionally, according to the results of a study by Bergman *et al.* [10], the highest risk of non-lethal self-injury behaviors was observed among veterans who had received minimum services, especially the veterans who did not complete the medical training courses nor had minimum participation in this course.

According to the theoretical evidence about PTSD and the high prevalence of this disorder, several treatment measures have been used based on the etiology of this disorder. Dialectical Behavior Therapy (DBT) is an evidence-based treatment method used to treat suicidal behaviors and disorders characterized by a lack of behavioral and emotional control [11]. DBT addresses five primary domains of emotional, interpersonal, self, behavioral, and cognitive dysregulation and uses a hierarchy of goals to effect change. First, it focuses on life-threatening and self-injury behaviors. Then, it focuses on behaviors that interfere with treatment. Finally, it examines behaviors and factors that interfere with the quality of life [12]. DBT is considered a transdiagnostic intervention that reduces emotion dysregulation and depression in various clinical samples [13]. In the area of veteran mental health services, DBT has been effective for veterans with borderline personality disorder [11] and non-psychotic veterans [14]. A study by Decker *et al.* [15] showed that group-based dialectical behavior therapy promotes veterans' use of coping skills to reduce the risk of suicide. The results of a review study by Johnstone *et al.* [17] revealed a significant improvement in suicidal thoughts, attempted suicide, self-injury behaviors (with or without suicidal thoughts), borderline personality disorder symptoms, depressive symptoms, trauma, behavioral problems, and overall functioning for DBT. A study by Wu *et al.* [17] showed that dialectical behavior therapy reduces self-injury behaviors, suicidal thoughts or attempted suicide, borderline symptoms, and mental distress in borderline personality disorder patients. In contrast, one study revealed that dialectical behavior therapy (DBT), as one of the best treatments currently available for borderline personality disorder, did not significantly improve PTSD. An attempt was made to address this problem by adding prolonged exposure to the standard DBT method [18]. Prolonged exposure (PE) therapy [19] is the first line of treatment for PTSD in veterans and military personnel [3]. In other words, PE is a controlled cognitive-behavioral treatment for PTSD rooted in emotional processing theory and exposure-based therapies. This theory assumes that psychological trauma caused by events is displayed in the person's memory as a specific fear structure, in which the fear structure is simply activated and causes distress to the person even without evaluation. Thus, it causes cognitive and behavioral avoidance, which is a way to reduce distress. Thus, avoiding and preventing the processing of the trauma causes the continuation of PTSD symptoms. In this regard, prolonged exposure therapy by performing planned exposures to cope with the avoidance of stimuli related to psychological trauma facilitates emotional processing and reduces the symptoms caused by it. PE treats PTSD by placing clients in fearful but safe situations (real exposure) or memories (imaginal exposure) [20].

The results of a study by Brown *et al.* [21] revealed a significant reduction in suicidal thoughts in

adolescents with PTSD in the exposure therapy group compared to client-centered therapy. The rate of reduction in depression and disorder symptoms in treatment was related to the rate of reduction in suicidal thoughts in treatment. In another study, Brown *et al.* [22] indicated that prolonged exposure therapy significantly reduces the rate of suicidal thoughts in military personnel. They also found that a reduction in post-traumatic stress disorder symptoms was associated with a reduction in suicidal thoughts. These results suggest that trauma-focused and non-trauma-focused treatments are associated with reduced suicidal thoughts. The results of a study by Burback *et al.* [23] showed the improvement of symptoms in post-traumatic stress disorder, depression, and symptoms of borderline personality, suicidal thoughts, and non-suicidal self-injury in trauma-focused psychotherapy in patients with suicidal thoughts. Shiner *et al.* [24] also indicated that only 6.8 percent of veterans receive cognitive processing therapy or PE for the treatment of PTSD. PE may not be consistent with the preferences of many PTSD patients who are challenged by logistical barriers, financial costs, uncertain times, and mixed motivations.

Since DBT alone does not directly address traumatic experiences or symptoms associated with PTSD, implementing an evidence-based therapy focused on trauma, such as exposure therapy at a certain period of treatment, can be crucial in achieving significant clinical gains for patients with PTSD or other traumatic disorders [25]. Moreover, DBT skills training can be effective in improving tolerance of initial distress in the treatment of exposure to trauma and facilitating the appropriate level of participation in people's exposure without a diagnosis of BPD. In integrated therapy of DBT-PE, dialectical behavior therapy is the required background or "Phase 1" for trauma-focused treatment to stabilize the risk of self-injury and to develop emotion regulation and distress tolerance skills to manage the initial disturbances and distress resulting from focusing on the trauma memories [26]. Early case studies in implementing standardized DBT in combination with modified PE date back to Harned and Linehan's [27] and Wagner *et al.*'s [28] studies on patients with BPD.

The DBT-PE protocol was developed to expand the range of evidence-based psychotherapies for PTSD. In other words, the DBT-PE protocol was expanded to provide effective PTSD treatment for patients who have severe multiple problems and are at high risk of suicide [29]. Its effectiveness in reducing the problems related to emotion dysregulation, functional disorders, depression, suicidal thoughts, and feelings of dissociation has been proven in people with PTSD [19, 28, 29]. The study by Mugambi [30] proved the efficacy of dialectical behavior therapy with prolonged exposure therapy in the suicidal behavior of adolescents suffering from PTSD and depression disorders.

The review of previous studies showed that no study has been conducted so far to investigate directly the effectiveness and integration of dialectical behavior therapy and prolonged exposure therapy on reducing self-injury behaviors of veterans with PTSD, and a few studies conducted regarding the effectiveness of these treatments have been based on other psychological symptoms. Thus, the present study aimed to compare the effects of DBT-PE, dialectical behavior, and prolonged exposure therapies in reducing self-injury behaviors in veterans with PTSD.

Materials and Methods

This experimental study was conducted with a pre-test/post-test design with a control group and a follow-up. The statistical population of this study consisted of all veterans with PTSD who were referred to Isar Ardabil Psychiatric Hospital in 2022 (N=160). Regarding sample selection, in the experimental method, each subgroup should be at least 15 people [31]. For the selected sample to be a true representative of the population and for the study to have a high external validity, the number of samples was considered to be 80 people (20 people for each group). Eighty 40-70-year-old veterans with PTSD based on DSM-5 in the evaluation by a psychiatrist and in the structured clinical interview for DSM-5 mental disorders and minimum secondary level of education were selected by purposeful sampling method. The individuals with diagnoses indeed PTSD and having disorders related to substance abuse were not selected. Unwillingness to continue the treatment, being absent for more than two sessions in the intervention sessions, attending other psychotherapy sessions, and the presence of psychotic symptoms (e.g., hallucinations and delusions) caused exclusion.

The following tools were used to collect data:

Structured Clinical Interview for DSM-5 (SCID-5-CV): This tool is a semi-structured diagnostic interview developed by First *et al.* [32] to diagnose mental disorders in DSM-5. The only disorders in SCID-5-CV evaluated in the lifetime format include major depression disorder, bipolar disorder I and II, schizophrenia spectrum and other psychotic disorders, panic disorder, and PTSD disorder [32]. The SCID-5-CV is administered in one session and mostly lasts between 45 and 90 minutes, depending on the complexity of the patient's psychiatric history and the patient's ability to describe his or her psychopathology. No information is available on the reliability or validity of the SCID-5-CV. However, some reliability studies have examined the reliability of its previous version, SCID-I. Several studies have indicated its good validity and reliability [32]. Sharifi *et al.* [33] reported moderate to good diagnostic agreement for most specific and general diagnoses (kappa above 0.6) and overall agreement (total kappa) for all current diagnoses (0.52) and all lifelong

diagnoses (0.55). Also, most interviewees and interviewers reported a good ability to implement the Persian version of SCID [34]. SCID-5-CV was translated into the Persian language in Iran by Shamloo [34].

Non-suicidal self-injury inventory: This inventory was developed by Klonsky and Glenn [35]. It is a self-report tool assessing the frequency and performance of non-suicidal self-injury behaviors. This inventory has two sections. The first section of the inventory assesses 12 different types of self-injury behaviors done intentionally without suicidal intention. They include hitting, banging/biting, burning, carving, cutting, wound picking, pinching, hair pulling, rubbing skin against rough surfaces, needle-sticking, severe scratching, and swallowing chemicals. It assesses the date of the most recent act of self-injury. The test-retest reliability of this section with an interval of 1 to 4 weeks was 0.85. Its internal consistency was also obtained at 0.84 by Cronbach's alpha method [34]. The second section of the inventory assesses the performance of 13 non-suicidal self-injury behaviors. These 13 functions are classified into two general factors; intrapersonal and interpersonal. The functional part of the list also has high construct validity and internal consistency [34]. Its questions are scored on a three-point Likert scale from 0 (quietly unrelated), 1 (almost related), and 2 (quietly related). In a study by Saffarinia *et al.* [35], the content validity of the inventory was approved, and its reliability was obtained at 0.76 using Cronbach's alpha method. In the present study, the scale's reliability was obtained at 0.79 using Cronbach's alpha.

Three therapy methods were used:

Dialectical behavior therapy (DBT): The first experimental group received dialectical behavior therapy based on Linehan's treatment protocol (1993) in 10 sessions of 90 minutes. The treatment begins by presenting the definition of dialectic and the principles and methods of thinking and acting dialectically, getting familiar with pervasive consciousness and mental states. Skills needed to achieve holistic awareness are taught and practiced. Survival strategies in crisis and reality acceptance skills are taught. Finally, the components of emotion regulation are examined and taught.

Prolonged exposure therapy (PE): The second experimental group received prolonged exposure therapy according to the treatment protocol of Foa *et al.* [19] in 10 sessions of 90 minutes. The primary goal of PE is to facilitate the emotional processing of trauma through systematic confrontation with trauma-related symptoms. PE includes three major components; Psychoeducation, repeated imaginal exposure (in which veterans will review their traumatic memories in a therapeutic context and emotional processing), and real exposure to situations and places that are avoided due to anxiety [19].

DBT-PE therapy: The third experimental group received the DBT-PE, a modular treatment program for 16 sessions of 90 to 120 minutes. The DBT-PE treatment protocol is based on PE [19] and is the first-line evidence-based treatment for PTSD [36]. It is integrated with standard DBT, a first-line evidence-based treatment for suicidal behaviors [38] and borderline personality disorder [38]. This integrated treatment uses a step-based approach in which life-threatening and other high-priority problems are addressed using DBT before adding a DBT-PE protocol aimed at treating PTSD [29]. In other words, it prioritizes life-threatening behaviors such as suicide attempts and treatment-interfering behaviors such as dissociation to solve problems that reduce quality of life. DBT-PE includes five steps: 1) anamnestic information is collected, psychoeducation is provided, and a treatment contract is signed; 2) Treatment goals are defined, an introduction to mindfulness is provided, exposure concerns are addressed, and therapist and patient develop an individualized model of PTSD development and maintenance. Moreover, distress coping skills from DBT are implemented to address problematic behavior; 3) Common strategies to escape from distressing trauma-related emotions at the behavioral, cognitive, and emotional levels (such as self-injury, dissociation, and feeling guilt) are identified and examined; 4) Exposure-based techniques are used. The exposure protocol allows the patient to control the intensity of memory activation and use skills during exposure sessions and tasks (skills-assisted exposure) to balance the vividness of trauma memories with the awareness of being in a safe (non-threatening) situation; and 5) Treatment focuses on the radical acceptance of trauma-related facts. An additional session is also applied six weeks after treatment.

After obtaining permission from the Research Department of Isar Hospital to access the veterans admitted to the hospital, the research subject was raised in the Medical Ethics Committee of the hospital, and the ethical approval of the research was obtained (Ethical Code: IR.UMA.REC.1401.009). First, to examine some of the inclusion criteria, after the diagnosis of PTSD by a psychiatrist, the veterans with PTSD were subjected to a structured interview (SCID-5-CV) by the researcher. Other inclusion criteria were also examined by referring to the psychiatric medical records. The veterans who met the inclusion criteria were selected as research samples. After obtaining the consent of the samples and assigning them to three experimental and control groups, before presenting the questionnaires and collecting information, the samples were individually informed about the objectives and quality of the research, and the necessary communication was established with them. After obtaining written consent from the veterans to participate in the intervention, the self-injury behaviors questionnaire was submitted to the

subjects to complete. This work was done individually. In the case of any ambiguity, while completing the questionnaires, the necessary guidance will be provided to the subject regarding implementing the relevant questionnaires. The first experimental group received dialectical behavior therapy for ten sessions of 90 minutes. The second experimental group received prolonged exposure therapy for ten sessions of 90 minutes, and the third group received DBT-PE combined therapy for 16 sessions of 90 to 120 minutes. The control group received no active and specific treatment. Post-test data were collected (with the same questionnaires used in the pre-test) two weeks after the completion of the interventions. Finally, after two months, the research subjects answered the questionnaires to follow the stability of the interventions.

To analyze the data, first, the descriptive indices of the variables were calculated using descriptive statistics methods. Then, a mixed analysis of the variance and Scheffe's post hoc tests were used.

Findings

The mean age of the DBT, PE, DBT-PE, and control groups were 54.32±6.12, 53.58±5.14, 53.42±5.12, and 56.12±4.31 years, respectively.

Table 1. Statistical description of self-harm scores by groups

Parameter	Stage	Mean	SD	p-Value*	p-Value**
Intrapersonal factors					
DBT	pre-test	13.55	3.07	p<0.001	p<0.001
	post-test	10.40	2.85		
	follow-up	11.75	11.75		
PE	pre-test	13.20	2.76	p<0.001	p<0.001
	post-test	8.55	2.54		
	follow-up	10.70	2.62		
DBT-PE	pre-test	12.55	3.32	p<0.001	p<0.001
	post-test	6.95	3.17		
	follow-up	8.95	3.30		
Control	pre-test	14.55	3.25	p<0.001	p<0.001
	post-test	13.40	2.91		
	follow-up	13.45	3.20		
Interpersonal factors					
DBT	pre-test	20.35	4.33	p<0.001	p<0.001
	post-test	16.30	4.04		
	follow-up	18.85	4.22		
PE	pre-test	21.25	4.54	p<0.001	p<0.001
	post-test	14.35	3.91		
	follow-up	17.65	4.31		
DBT-PE	pre-test	21.40	5.69	p<0.001	p<0.001
	post-test	13.15	4.66		
	follow-up	15.80	4.85		
Control	pre-test	22.35	6.49	p<0.001	p<0.001
	post-test	22.10	6.97		
	follow-up	21.95	6.59		
Total score					
DBT	pre-test	33.90	7.10	p<0.001	p<0.001
	post-test	26.70	6.55		
	follow-up	30.60	6.90		
PE	pre-test	34.45	5.71	p<0.001	p<0.001
	post-test	22.90	5.22		
	follow-up	38.35	5.88		
DBT-PE	pre-test	33.95	8.53	p<0.001	p<0.001
	post-test	20.10	7.40		
	follow-up	24.75	7.42		
Control	pre-test	36.90	9.10	p<0.001	p<0.001
	post-test	35.5	9.04		
	follow-up	35.40	8.99		

There were no significant differences between the age and marital status of the groups (Chi-square test; p>0.05).

According to the Shapiro-Wilk statistic test, the distribution of self-injury subscales in the pre-test, post-test, and follow-up is normal (p>0.05).

Levene's test was used to check the homoscedasticity of the self-injury behavior variable; Considering the lack of significance (p<0.05), the assumption of homogeneity of variances was maintained. Mauchly's Test of Sphericity was used to check the assumption of homogeneity of variance and covariance; Considering the non-significance of Mauchly's test (p<0.05), the significance level of the Sphericity assumed test should be used for hypothesis testing.

There was a significant difference between the growth of self-injury behavior during pre-test, post-test, and follow-up. The interaction effect between research stages and group membership was also significant (p<0.001), which shows that the difference between the stages at the levels of the groups was not the same (Table 2).

Table 2. Mixed analysis of variance test to examine the within-group effects in the self-injury behavior

Sum of squares	SS	df	MS	F	Sig	Effect size
Time	2922.03	2	1461.02	1123.86	0.001	0.937
Time*Group	948.37	5.65	167.80	121.59	0.001	0.828
Error	197.60	143.18	1.38			

There was a significant difference between the control group and the three groups of DBT-PE, DBT, and PE in terms of reducing self-injury behavior in veterans with PTSD (p<0.01). Also, according to the mean difference, there was a significant difference between the three experimental groups (p<0.01); and DBT-PE had a greater effect than the other two treatments on reducing self-injury behavior. Also, PE had a greater impact on reducing self-injury behavior than DBT (Table 3).

Table 3. The difference between the effectiveness of DBT-PE, DBT, and PE (Scheffe's test) in terms of reducing self-injury behavior in veterans with PTSD

Group		Mean difference	Sig
Control	DBT	5.53	0.013
	PE	7.37	0.005
	DBT-PE	9.67	0.001
DBT	PE	1.83	0.049
	DBT-PE	4.13	0.02
PE	DBT-PE	2.30	0.038

Discussion

The present study compared the effects of DBT-PE therapy, dialectical behavior therapy, and prolonged exposure therapy in reducing self-injury behaviors in veterans with PTSD.

The results showed that dialectical behavior therapy reduced self-injury behaviors in veterans with PTSD. The obtained results are in line with the research findings of Johnstone *et al.* [16], Decker *et al.* [15], and Wu *et al.* [17]. In explaining this result, it can be stated

that self-injury is related to emotional disorders and traumatic experiences in childhood, such as physical and sexual abuse. In other words, this behavior is a compensatory strategy in post-traumatic adaptation and helps intra-personal and interpersonal regulation. Thus, emotional dysregulation and childhood trauma are considered aspects related to the developmental process in the context of self-injury and suicidal behavior. Also, difficulties in emotion regulation, especially impulse control and goal-directed behavior, mediate significant reductions in self-injury to some extent. Thus, interventions aimed at reducing self-injury should specifically target emotional disorders rather than other related mental health disorders. Dialectical behavior therapy affects patients who tend to experience biological problems in regulating their emotions [36]. Dialectical behavior therapy helps a person to better adapt to painful conditions by teaching skills such as tolerating helplessness by increasing flexibility providing new solutions, and adjusting to uncomfortable conditions. Moreover, it helps a person to identify his or her feelings more accurately and then evaluate each emotion by using emotion regulation skills. Its goal is to regulate emotions without reactive and destructive behavior [37]. Dialectical behavior therapy requires a person to have a different relationship with their unpleasant experiences and to be aware of the decision to respond to emotions by accepting unpleasant feelings. Additionally, this process increases psychological flexibility, reduces the use of negative emotion regulation strategies, and reduces the rate of self-injury behaviors in patients [36]. Interpersonal skills can be improved by teaching interpersonal skills in dialectical behavior therapy. This therapeutic method helps people solve conflicts and make decisions by teaching problem-solving skills and increasing personal efficiency and self-control [15]. In other words, dialectical behavior therapy is a preventive and effective approach to reducing suicide and self-injury and helps a person learn adaptive skills to reduce self-injury.

The results showed that prolonged exposure therapy reduced self-injury behaviors in veterans with PTSD. The obtained results are in line with the research findings of Brown *et al.* [21], Brown *et al.* [22], and Burback *et al.* [23]. In explaining this result, it can be stated that one of the traits of people suffering from post-traumatic stress disorder is the disconnection of interpersonal relationships, which is a risk factor for suicide and self-injury [8]. Feelings that one does not belong to society and is a burden on social connections are risk factors for suicidal thoughts. These feelings increase in war veterans [9] and military personnel with PTSD [10]. The person is helped in prolonged exposure therapy to learn by practicing and working on the fears. It helps the person to get used to the fear and retrain the brain to stop sending the fear signal when facing something that is not considered a real danger. Prolonged and intentional exposure to fearful stimuli and active inhibition of avoidance associated with them (response prevention) help patients experience higher anxiety in the short term. However, it reduces anxiety and avoidance in the long term through the process of extinction, and this is related to the increase of positive mechanisms. A person can cope with life's problems by maintaining positive performance and including adaptation and personal growth in various and challenging situations. Using this treatment method, people's social skills are improved, and they find self-control and awareness of their feelings [19]. Also, a person learns that he or she can endure situations and nothing bad will happen to him or her with the help of memories and reminders of trauma. Moreover, they learn to calm their anxiety even when they are facing the trigger of their fear. Coping exercises help people identify the differences between similar but harmless situations and see the trauma as an event in a special space and time. It helps the person abandon the feelings and thoughts about the dangerousness of the situation [22].

The results showed that DBT-PE reduced self-injury behaviors in veterans with PTSD. The obtained results are in line with the research findings of Harned *et al.* [18], Harened *et al.* [29], and Mugambi [30]. In explaining this result, it can be stated that the low rate of self-injury is primarily due to conditioning the integrated treatment protocol to gain control over these behaviors. The promise of an effective treatment for a problem seen by the patient as a priority appears to be a powerful factor that reinforces gaining rapid control over self-injury. Thus, instead of exacerbating intentional self-injury tendencies and behaviors, this therapy can reduce the number of these behaviors, especially among patients who have the motivation to receive PTSD treatment [18]. Additionally, this therapy can play an effective role in reducing distorted beliefs about surrounding events and maintaining function in post-traumatic stress disorder. In other words, it reduces post-traumatic maladaptive cognitions and reduces interpersonal problems [30]. It helps patients to better understand their own and others' mental states and intentions. Engaging in this type of active thinking about other people's intentions can reduce negative emotions underlying post-traumatic stress disorder, such as violence and other antisocial behaviors, instead of acting impulsively based on basic instincts [29]. It is focused on emotional regulation and acceptance of the patient's injury and surrounding feelings. Thus, it can be expected that this therapy can reduce self-injury and suicide attempts and improve mood and interpersonal function.

The results showed that there is a significant difference between the three treatment methods, that the effectiveness of the DBT-PE was more than PE, and that exposure therapy was more effective

than DBT in reducing self-injury behaviors in veterans with PTSD. Similar research has not been done in this direction. In explaining this result, it can be stated that this treatment protocol for post-traumatic stress disorder is based on prolonged exposure therapy and integrates dialectical behavioral therapy strategies and methods to address the specific traits of this population [19].

The therapeutic effects of dialectical behavior therapy and exposure therapy are less stable. However, improving patients' conditions is more stable in this therapy. Additionally, the reduction in the severity of post-traumatic stress disorder symptoms during dialectical behavior therapy can be due to the use of dialectical therapy skills in anxiety management and non-specific therapeutic factors (such as therapeutic alliance and therapy structure). Also, therapists often do not provide trauma-focused therapy with exposure elements since they fear that exposure elements may be too distressing and increase patients' risk of engaging in suicidal, self-injury, aggressive, or substance-using behaviors. However, this therapy protocol changes the underlying mechanisms of PTSD, such as trauma-related cognitions, resulting in more stable and fundamental changes [39].

It leads to more improvements in patients suffering from post-traumatic stress disorder without jeopardizing the safety of patients. After completing the treatment, the suicidal thoughts decrease. In other words, it reduces the urge to engage in self-injury behaviors [20].

Since the statistical population of the present study included only PTSD veterans of Isar Ardabil Psychiatric Hospital, we should treat with caution in generalizing the results to other populations. Lack of control of variables such as concurrent drug treatment, lack of investigating all events related to the history of trauma causing PTSD symptoms, duration and severity of the disorder, the frequency of self-jury behaviors, and its method and seriousness, lack of examining co-morbidities of PTSD such as depression, and anxiety were another limitation of this study. To increase the generalizability of the results, it is recommended that future studies consider different cities and ages, civilians, people and women, and other cognitive disorders. It is also recommended for future studies to examine concurrent drug treatment, history of trauma, duration and severity of the disorder, frequency and method of self-injury, and co-morbidities of PTSD disorder by focusing on the research variables.

Conclusion

The combined treatment method has a greater effect in reducing self-injury behaviors in veterans with PTSD compared to prolonged exposure therapy and dialectical behavior therapy. Also, prolonged exposure therapy has a greater effect than dialectical behavior therapy.

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Ethical Permissions: Common codes of ethics in medical research include 14, 13, 2 (benefits from the findings for the advancement of human knowledge), 20 (coordination of research with religious and cultural standards), and 1, 3, 24 (satisfaction subjects and his legal representative) have been observed in this research. Written informed consent was obtained from all participants. All methods were performed following the relevant guidelines and regulations (IR.UMA.REC.1401.009).

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