



The effectiveness of the unified protocol for transdiagnostic treatment of post-traumatic stress disorder, depression, and anxiety symptoms of earthquake survivors

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Abstract:

BACKGROUND: Natural disasters such as earthquakes could affect large populations, leaving many of the survivors with psychological disorders, namely, post-traumatic stress disorder (PTSD), anxiety, and depression, in which emotion regulation problems play a central role. Studying the effectiveness of the transdiagnostic unified protocol on this group of patients who may have undergone several postearthquake psychological disorders for years could deliver promising results.

MATERIALS AND METHODS: This quasiexperimental study included pretest, post-test, and a 2-month follow-up period, with a control group. The population included all patients with post-traumatic stress disorder in Sarpol-e Zahab city. A sample of 33 people suffering from post-traumatic stress disorder was selected through available sampling and randomly assigned to two experimental (11 people) and control groups (22 people). All participants completed Mississippi Scale for Combat-Related PTSD (M-PTSD) for DSM-III, Beck Depression Inventory (BDI-II), and The Hamilton Anxiety Rating Scale (HARS) in the pretest, post-test, and follow-up (two-month) assessments. The data were analyzed using SPSS-23 one-way analysis of covariance.

RESULTS: Compared to the control group, the patients in the transdiagnostic unified protocol group experienced significant reductions in PTSD symptoms and comorbid depressive and anxiety symptoms ($P = 0.01$). Furthermore, the effect size in the experimental group was higher than medium.

CONCLUSION: According to the findings, the unified protocol for transdiagnostic treatment had propitious results in alleviating the symptoms of PTSD and comorbid disorders emerging after Sarpol-e Zahab earthquake. Therefore, this intervention could be a potential substitute for the TAU provided by the Ministry of Health.

Keywords:

Anxiety, depression, earthquake survivors, post-traumatic stress disorder

Introduction

In the year 2018, a powerful earthquake of magnitude 7.3 hit Sarpol-e Zahab, resulting in approximately 500 fatalities, over 10,000 injuries, and leaving thousands without homes. Studies conducted in past years on earthquakes have shown that earthquakes and unexpected natural disasters can lead

to serious psychological and physical symptoms called post-traumatic stress disorder (PTSD) in 10–30% of people.^[1] The approximate rate of PTSD in the general population is said to be between 1 and 9%, with survivors of catastrophic disasters.^[2]

According to Green's (2006) findings, anxiety and depression are the most

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common comorbid symptoms observed in patients with PTSD.^[3] Therefore, the comorbidity of PTSD with other disorders may be one of the main reasons for the high prevalence of PTSD in populations exposed to traumatic experiences. Furthermore, as a chronic illness, PTSD not only incurs high socioeconomic costs but also can have irreversible consequences for individuals and society if left untreated.^[4]

Numerous randomized controlled studies have been carried out to assess the effectiveness of various therapies (mainly trauma-focused cognitive-behavioral methods) on PTSD. Being put to independent or supplementary use, these treatments include cognitive therapy, stress inoculation training (SIT), eye movement desensitization and reprocessing (EMDR), exposure therapy, and prolonged exposure. Several randomized controlled trials have been conducted to evaluate the efficacy of different treatments, primarily trauma-focused cognitive-behavioral techniques, for PTSD. These interventions can be utilized independently or in addition to one another, such as cognitive therapy, SIT, EMDR, exposure therapy, and prolonged exposure. Some researchers claim that even though therapy can effectively reduce symptoms, 33% of adult patients still get diagnosed with PTSD after therapy ends, with another 25% choosing to drop out of treatment.^[5] Potential reasons may include resistance to trauma-centered therapies and the presence of comorbid disorders, which can make therapy planning and engagement more challenging.^[6]

However, the high prevalence of comorbidity in emotional disorders has made cognitive-behavioral treatments more challenging, leading to complications in economic and clinical aspects. Therefore, alternative treatment methods are required to meet the needs of individuals suffering from various forms of trauma-related mental disorders.^[7] On the other hand, all these treatments are trauma-focused and primarily focus on the symptoms themselves, rather than on the underlying mechanisms. Growing evidence points to shared underlying mechanisms of psychiatric disorders, including negative affect, emotional avoidance, anxiety sensitivity, emotion dysregulation, cognitive distortions, distress intolerance, and experiential avoidance. The Unified Protocol for Transdiagnostic Treatment of emotional Disorders (UP) is a psychological intervention that targets these transdiagnostic mechanisms.^[8]

Two studies by Varkovitzky *et al.* and O'Donnell *et al.* found that the transdiagnostic unified protocol is effective for treating PTSD and its comorbid symptoms of anxiety and depression in American veterans and severely injured individuals.^[8,9] However, trauma varies in type (e.g., sexual violence, accidents, war, natural disasters such as floods, earthquakes, and typhoons),

intensity, duration, prevalence of PTSD symptoms, and comorbidities.^[10] However, the effectiveness of the Transdiagnostic Unified Protocol as a non-trauma-based therapeutic intervention to treat complex psychological disorders other than PTSD (emotional disorders such as depression and anxiety) requires further research. Moreover, the adverse effects of the 2018 Sarpol-e Zahab earthquake led to a significant prevalence of PTSD in the region, with people in the earthquake area (including our sample) continuing to suffer from distressing symptoms of PTSD, depression, and anxiety years later. Considering the insufficient number of research studies in this field and the advantages of a transdiagnostic unified protocol, the present study aims to evaluate the effectiveness of Barlow's unified protocol for the transdiagnostic treatment of post-traumatic stress disorder and other comorbid symptoms in survivors of the Sarpol-e Zahab earthquake. In other words, the aim is to examine whether the Transdiagnostic Unified Protocol can reduce symptoms of post-traumatic stress disorder, as well as comorbid symptoms of anxiety and depression, in traumatized people who have been suffering from these symptoms chronically since the Sarpol-e Zahab earthquake.

Materials and Methods

Study design and setting

This research was a randomized controlled trial in which one group received the transdiagnostic unified protocol and the other group received TAU offered by Iran's Ministry of Health and Medical Education. The conducted sampling method was convenience sampling, and the population consisted of all individuals who had been diagnosed with psychological symptoms according to the reports of their psychiatrists after Sarpol-e Zahab earthquake, Iran, in 2018.

Study participants and sampling

The individuals were patients who experienced post-traumatic stress disorder. A psychiatrist diagnosed these patients with post-traumatic stress disorder using the DSM-5. They visited Farabi Hospital located in Kermanshah. Prior to participating in the study, the participants were once more evaluated by a clinical psychologist (PhD) who conducted a diagnostic interview utilizing the DSM-5 and SCID-IV to provide a diagnosis. G*Power software was utilized to determine the sample size, which was determined based on the effect size of the previous studies.^[9] The calculated sample size was 21 subjects based on the effect size of 0.43, a power of 0.80, and a significance level of 0.05, but it was increased to 33 subjects to account for subject loss and improve generalizability of results. Finally, 40 patients were part of the study, but seven of them did not take part for reasons like lack of interest, undergoing other treatments, and substance abuse. The participants were then randomly

divided into two experimental groups (22 participants each) and a control group (11 participants). Inclusion criteria were being aged more than 18 years old, having at least a secondary school diploma, being diagnosed with PTSD (as the main diagnosis) after Sarpol-e Zahab earthquake by a psychiatrist and according to a diagnostic interview by a clinical psychologist, being interested and having informed consent to participate in the therapeutic intervention, not experiencing dissociation symptoms, being diagnosed with psychotic or bipolar disorders, and uncontrollable flashback experiences. Exclusion criteria were not doing homework assignments, being absent in at least three consecutive sessions, and unwillingness to continue participation. In post-test stage 2, patients of the experimental group could not complete the post-test and follow-up stages [Figure 1].

Data collection tool and technique

After obtaining the ethics code from Kermanshah University of Medical Sciences, the researchers visited Farabi Hospital. To keep our study single-blind in post-test and follow-up assessments, PTSD questionnaire, BDI-II, and HARS were completed under the observation of a different trained psychologist for the post-test and follow-up. Twelve weekly individual treatment sessions were conducted for all participants in the experimental group. The control group's subjects were also provided with three weekly individual common treatment sessions. The stages of both therapeutic programs were applied in one private clinic in Ghasr-e Shirin, which was a city near the epicenter of the earthquake. The therapist (first author) was a graduate clinical psychology student trained

in Iranian Clinical Psychology Association to conduct Barlow's unified protocol for transdiagnostic treatment. The unified protocol for transdiagnostic treatment of emotional disorders – therapist guidebook (second edition) was utilized for conducting therapy sessions (Unified Protocol treatment content is shown in Table 1). This protocol is designed for individuals suffering from emotional disorders, especially anxiety and mood disorders, and is considered a transdiagnostic cognitive-behavioral treatment with an emotional focus.^[11] Consisting of five core therapeutic modules, this program targets the main aspects of processing and regulating emotional experiences. The experimental group's program included 12 60-minute individually treatment sessions of Barlow's transdiagnostic unified protocol. Common treatment suggested by Iran's Ministry of Health was included of familiarizing the participants with earthquakes and their effects on individuals, debriefing, psychoeducation and relaxation, imaginal exposure, and emotional release. This program consisted of three therapeutic sessions (each lasting an hour).

The Mississippi scale of PTSD (M-PTSD)

Developed by Keane *et al.* (1988), this self-report scale is utilized for assessing the intensity of PTSD symptoms. This survey includes 39 questions rated on a Likert scale from 1 (completely true) to 5 (completely false). The questionnaire ranges from a minimum score of 39 to a maximum score of 165. The test-retest method yielded a reliability score of 0.97 for this questionnaire, while its convergent validity was reported as 0.47.^[12] The Persian version of M-PTSD has been validated by

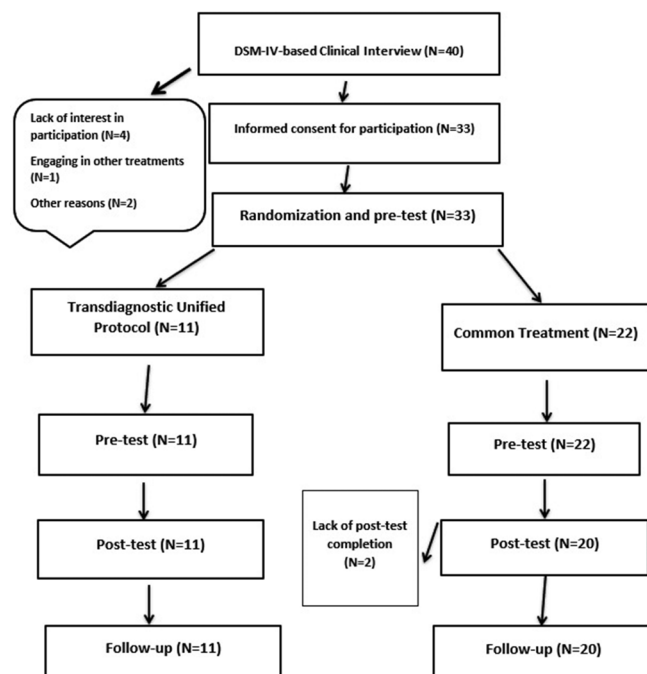


Figure 1: The flowchart for study stages and data analysis

Table 1: Unified Protocol treatment content

Session	Content
1	Identifying the advantages and disadvantages of change; presenting the rationale of the treatment; identifying the specific long-term goals of therapy
2	Presenting psychoeducation regarding emotion recognition and tracing emotional experiences
3 & 4	Education on emotional awareness; learning to observe emotional experiences; gaining objective, nonjudgmental, and present-focused awareness regarding emotional experiences
5	Cognitive evaluation and reappraisal, learning to identify maladaptive automatic evaluations and common thinking traps
6	Familiarization with emotional avoidance and its influence on emotional experiences
7	Getting familiar with emotion-based behaviors and comprehending their impacts on emotional experiences
8	Confrontation with aversive internal bodily sensations through exposure exercises
9-11	Visceral confrontation, gaining awareness of the rationale behind emotional exposure, ongoing exercises of emotional exposure with intense emotions
12	Relapse prevention, goal setting through "practice the program" to facilitate treatment benefits and continue progress

Goodarzi (2003) with a reported Cronbach's alpha of 0.92. Its validity was 0.38.^[13]

The Beck depression inventory (BDI-II)

This scale was designed (1963) and revised (1994) by Beck to measure the levels of depression. With a maximum total score of 63, every statement on this 21-item scale is rated on a range of 0 to 63. A concurrent validity of 0.79 and a test-retest validity of 0.67 were reported by Beck *et al.*^[14] According to Hamidi *et al.*^[11] (2015), the Cronbach's alpha and test-retest coefficient for BDI-II are measured to be 0.87 and 0.74, respectively. In their work, they have also reported the correlation between BDI-I and BDI-II (0.93).

The Hamilton anxiety rating scale (HARS)

The Hamilton Anxiety Rating Scale (HARS) was used to measure the severity of anxiety symptoms (1959). HARS consists of 14 items. Each question was given a score from 0 to 4, with a minimum total score of 0 and a maximum total score of 56. The questionnaire had a Cronbach's alpha of 0.74 and a reported convergent validity of 0.63.^[15] The Persian version of this scale showed that the Cronbach's alpha and convergent validity were 0.71 and 0.43, respectively.^[16]

Ethical consideration

This study has been approved by the ethics committee of Kermanshah University of Medical Sciences (IR.KUMS.REC.1398.698). In order to comply with ethical standards, all subjects filled out a consent form before starting the

study. They could withdraw the study at any time. All their personal information was kept confidential.

Statistical analysis method

SPSS-23 software was used for data analysis. Normality of the data was checked using the Kolmogorov-Smirnov test. Frequencies, percentages, means, and standard deviations were reported in the descriptive statistics section, while one-way ANCOVA was used for the inferential statistics.

Results

On the whole, a final number of 40 individuals participated in our study, 18 of whom were women (45%) and 22 were men (55%). With a mean age of 24.3 years, no significant difference was detected between the two groups in terms of age or gender. Moreover, the pretest results of M-PTSD, BDI-II, and HARS were not significantly different ($P = 0.01$).

According to the results reported in Table 2 and Figure 2 and considering the presented means in post-test results of the control and experimental groups, it can be concluded that the transdiagnostic unified protocol has led to reductions in the post-test total scores of M-PTSD ($P < 0.001$), BDI-II ($P < 0.001$), and HARS ($P < 0.001$) in the experimental group compared to the control group.

To determine the significance of the effectiveness of the conducted program, a one-way ANCOVA was

Table 2: The means and standard deviations for study variables in pretest, post-test, and the 2-month follow-up stages

Variable	Experimental group			Control group			P
	Pretest M (SD)	Post-test M (SD)	Follow-up M (SD)	Pretest M (SD)	Post-test M (SD)	Follow-up M (SD)	
Posttraumatic Stress Disorder (PTSD)	63.58 (5.79)	31.75 (6.06)	26.36 (4.50)	63.66 (7.41)	44.72 (4.88)	37.54 (6.69)	0.001
Beck Depression Inventory (BDI-II)	28.91 (9.49)	15.41 (5.26)	11.63 (4.08)	28.83 (9.34)	19.27 (7.17)	17.54 (7.47)	0.001
Hamilton Anxiety Rating Scale (HARS)	40.08 (13.32)	19.50 (7.09)	17.63 (5.66)	41.58 (11.42)	29.45 (8.05)	27.90 (6.80)	0.001

PTSD=Posttraumatic Stress Disorder, BDI=Beck Depression Inventory, HARS=Hamilton Anxiety Rating Scale

Table 3: ANCOVA results for PTSD, BDI-II, and HARS questionnaires in post-test and follow-up stages in the experimental group

Variable	Stage	Source	df	Mean Square	F	Sig.	Eta Squared
Posttraumatic Stress Disorder (PTSD)	Post-test	Pre-test	1	9.339	0.259	0.593	0.015
		Group	1	962.782	30.415	0.001	0.603
	Follow-up	Pre-test	1	10.429	0.309	0.585	0.016
		Group	1	694.499	591.20	0.001	0.520
Beck Depression Inventory (BDI-II)	Post-test	Pre-test	1	688.554	105.490	0.001	0.841
		Group	1	178.034	27.276	0.001	0.507
	Follow-up	Pre-test	1	406.0766	24.172	0.001	0.508
		Group	1	270.616	16.108	0.001	0.459
Hamilton Anxiety Rating Scale (HARS)	Post-test	Pre-test	1	661.221	24.467	0.001	0.550
		Group	1	540.355	19.994	0.001	0.500
	Follow-up	Pre-test	1	201.807	6.592	0.019	0.258
		Group	1	522.581	17.071	0.001	0.473

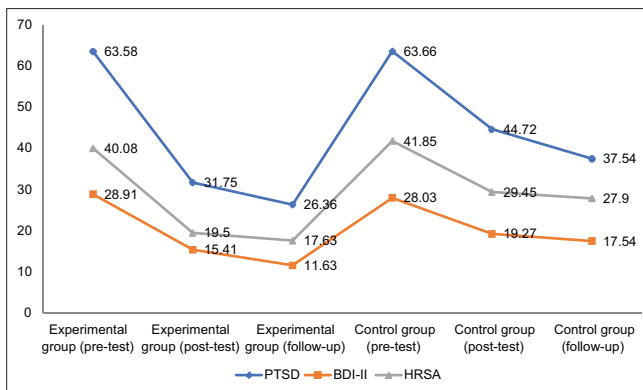


Figure 2: The mean scores of PTSD, BDI-II, and HARS questionnaires in experimental and control groups

applied [Table 3]. Measurements in pretest, post-test, and follow-up stages indicated the significant differences between the experimental and control in PTSD, BDI- II, and HARS ($P < 0.001$). The effect size for PTSD, BDI- II, and HARS in the post-test stage was 0/60, 0/50, and 0/50, respectively ($P < 0.001$). Also, the effect size for PTSD, BDI- II, and HARS in the follow-up stage was 0/52, 0/45, and 0/47, respectively [Table 3].

Discussion

To the best of our knowledge, the current research is the first to have studied the effectiveness of the transdiagnostic unified protocol on PTSD and its comorbid symptoms in earthquake survivors. The results revealed that this therapeutic intervention can lead to statistically and clinically significant alleviations in the clinical symptoms of PTSD as the main diagnosis in post-test and follow-up assessments. These findings are in line with investigations of Varkovitzky *et al.* (2018) and O'Donnell *et al.* (2021), who found that the transdiagnostic unified protocol could reduce patients PTSD symptoms in patients.^[8,9] However, as a result of using the unified protocol, the intensity of the comorbid symptoms of anxiety and depression was clinically improved. In addition, the positive impacts of this treatment were continued in the follow-up assessments too. These findings imply that according to its logic and in line with the claims of its creators regarding targeting the mutual and transdiagnostic factors of disorders, the transdiagnostic unified protocol indicated its effectiveness in the hurricane survivors too.^[17] Moreover, in addition to confirming the effectiveness of this therapeutic method in alleviating comorbid symptoms, our findings are in concordance with the research with case studies^[18,19] and also with a clinical trial assessing the effectiveness of this treatment on the comorbid emotional disorders of patients with anxiety disorders.^[7]

A noteworthy point about our investigation is that the sample consisted of individuals whose treatment had

become complicated as a result of being pressured by the symptoms of PTSD, depression, and anxiety years after the earthquake. Another important aspect of this study is that the control group received the common therapeutic intervention offered by Iran's Ministry of Health. The effectiveness of the mentioned protocol had not previously been examined in postearthquake PTSD sufferers in Iran, and the current research was the first study to compare and assess this treatment in a control group.

Limitations and recommendations

However, the present study has limitations that should be considered when generalizing the findings. The number of comorbid symptoms (such as symptoms of mania or obsessive-compulsive disorder) was not taken into account due to the fact that each of these disorders includes many transdiagnostic factors which could be examined more properly in other studies separately and independently. Even though the sample size of our study was determined according to the previous investigations on the unified protocol, it was still insufficient. In fact, by selecting a small sample size, the authors aimed to use the provided facilities, time, and energy efficiently to the highest extent. This program was designed for 12 sessions; nonetheless, some therapeutic components, namely, emotional awareness and cognitive reappraisal, were emphasized in one session only. Utilizing these components in more sessions could improve the results. Furthermore, performing emotional exposure in more sessions and in longer durations, which was not applied due to time limitations, could generate more enhancements. The other limitation was the variable intensity of the comorbid symptoms from clinical to subclinical levels (not necessarily as severe as PTSD symptoms), and this aspect was not measured and considered due to the fact the main focus was on the main comorbid symptoms. Considering the above limitations, future studies should investigate the effectiveness of this treatment with larger sample sizes, more severe PTSD symptoms, and longer follow-up periods.

Conclusion

Being an earthquake-prone country, Iran undergoes many experiences of earthquake and other natural disasters namely floods, storm, sandstorm, and snowstorm. As a result of such crises, a high percentage of individuals are put at stake of developing PTSD and its comorbid symptoms, some of which could result in short-term consequences like suicidal acts or addiction in the long term. Treatment complexity in the studied sample, expressing unwillingness to take part in trauma-focused therapies by some patients, and the positive results of the transdiagnostic unified protocol

in the current research, may develop a promising future in the treatment of chronic and complex cases of PTSD caused by disasters of these kinds. In total, given the positive impact of this treatment on depression, anxiety, and PTSD in individuals with post-traumatic stress disorder, therapists can utilize this approach as a viable option to alleviate symptoms of depression, anxiety, and PTSD in those affected by this condition.

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Conflicts of interest

There are no conflicts of interest.

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