



# Effectiveness of a Combined Mindfulness-Based Cognitive Therapy and Mindfulness-Based Stress Reduction Intervention on Depression Symptoms and Quality of Life in a Group of Iranian Veterans with Posttraumatic Stress Disorder

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## Abstract

**Background:** Comorbidity of anxiety and mood disorders is rather common, making the treatment of each disorder more difficult. Posttraumatic stress disorder (PTSD) is one of the anxiety disorders with a high degree of association with depression; PTSD-depression comorbidity can significantly affect the quality of life of the ones affected. Hence, using the best way to deal with each of these disorders is highly recommended.

**Objectives:** The current study aimed at evaluating the effectiveness of a combined treatment of mindfulness-based stress reduction (MBSR) and mindfulness-based cognitive therapy (MBCT) on PTSD and comorbid depression in combat veterans.

**Methods:** Among patients referring to Kashan Veterans Counseling Center, 62 patients diagnosed with comorbid PTSD and depression according to diagnostic and statistical manual of mental disorders-fourth edition-text revision (DSM-IV-TR) were selected, and randomly assigned into the two groups of case and control. The study was conducted in 2012.

**Results:** Statistical analysis showed that after the intervention, the depression scores of the case group significantly decreased, while the similar trend was not observed in the control group ( $P < 0.05$ ). Furthermore, the total score and the scores of "mental health" and "social functioning" subscales of quality of life significantly increased in the case group.

**Conclusions:** According to the observed results, it seems that the combined treatment administered to the case group could aid the participants overcoming depression symptoms and subsequently raised their quality of life.

**Keywords:** Cognitive Therapy, Depression, Mindfulness, Posttraumatic Stress Disorder, Veterans

## 1. Background

War has deep negative impact on the mental health of veterans and victims. According to Iran's Martyrs and Disabled Veterans' Organization, there are more than 400,000 veterans in the country. Some studies show that 95.3% of the chemically injured victims of the imposed Iran-Iraq War have psychological disorders. The most prevalent complications are mood and anxiety disorders including posttraumatic stress disorder (PTSD) (1). PTSD is a common problem among veterans that is often associated with a significant decrease in the level of quality of life (QOL). Symptoms of the disorder often persist for decades and are usually associated with disturbances in interpersonal areas, physical impairments, and higher rates of substance abuse and suicide (2).

PTSD is largely associated with depressive symptoms. Studies show that 21% - 94% of patients diagnosed with PTSD also had major depressive disorder (MDD) (3). Patients diagnosed with comorbid PTSD and depression have more negative perceptions about their health status (4).

It is broadly accepted that depression has a significant negative impact on the QOL. QOL refers to the relationship between individuals' physical health and their ability to pursue their goals and values in line with promoting their lives. This construct consists of subjective and dynamic dimensions (5).

Various studies developed different assumptions about whether the PTSD and depression symptoms after trauma are separate constructs or a general response to distress derived from a single factor underlying both

phenomena (6).

At least two hypothetical mechanisms seem to be involved in the maintenance and exacerbation of the symptoms of both conditions. The first is rumination. According to Nolen-Hoeksema, rumination is a cognitive style of repeated negative thinking in response to emotional problems (7). Some characteristics of rumination, such as repeated unproductive thoughts and "why" and "what if" type questions, are significantly associated with PTSD (6). The mediating role of rumination in exacerbating the symptoms and lengthening the course of depression is shown by many studies (8, 9). Rumination through focusing on the causes, consequences, and implications of an event rather than its components, prohibits the person from fully processing the occurrences; therefore, psychological turmoil is decreased in the short term, but in the long term, PTSD symptoms and subsequent feelings of helplessness, hopelessness, and depression may be intensified (3).

The second mechanism involved in the comorbidity of depression and PTSD is "experiential avoidance" (EA). It refers to attempts to avoid thoughts, feelings, memories, physical sensations, and other internal experiences in order to change and control the traumatic experiences. EA is then negatively reinforced through short-term relief of emotional discomfort achieved through avoidance, but in the long term, it aggravates the patients' symptoms and reduces their QOL (10). Therefore, the theoretical assumption is that alternative approaches offering different styles of being in contact with the world such as mindfulness training techniques could be useful to help patients face with their unbearable trauma and overcome their experiential avoidance and ruminations.

Cardaciotto et al. assumed mindfulness as a state toward greater awareness of the individual's experiences, and embracing the experiences nonjudgmentally. Several studies found that posttraumatic stress symptoms and anhedonic depression are inversely associated with non-judgmental acceptance and acting with awareness (11). For this purpose, they used different mindfulness-based methods such as mindfulness-based cognitive therapy (MBCT) or mindfulness-based stress reduction (MBSR) (12).

Behavioral techniques such as eye movement desensitization reprocessing (EMDR) and application of medication partly improve the symptoms of patients, however, some residual symptoms, especially in the area of comorbid disturbances still remain; therefore, complementary intervention methods are needed to effectively deal with such comorbidities (13). In the current study, since the study sample had comorbid depression and PTSD, a condition essentially related to the category of anxiety disorders, and since in the field of mindfulness therapies there

are separate protocols for each disorder, the combination of two protocols- i.e., MBCT and MBSR, seems to have the greatest effect on the veterans' severity of depression and QOL. Therefore, the current study aimed at evaluating the effectiveness of the combined MBCT and MBSR protocol on depression and QOL in veterans with PTSD.

## 2. Objectives

In the present study, since the study sample has comorbid depression and PTSD, a condition essentially related to both categories of anxiety and mood disorders, and because in the field of mindfulness therapies there are separate protocols for each disorder, the combination of two protocols, i.e., MBCT and MBSR, seems to have the greatest effect on the veterans' severity of depression and QOL. So, the aim of the present study is to evaluate the effectiveness of the combined MBCT and MBSR protocol on depression and quality of life of veterans with PTSD.

## 3. Materials and Methods

### 3.1. Patients and Design

The current case-control study was conducted on a group of male patients attending Veterans Counseling Center of Kashan, Iran. Of the 160 cases in the medical center, 62 patients meeting the inclusion criteria were selected and using simple randomization method by the table of random numbers, were assigned into the case and the control groups (each consisted of 31 individuals). The patients aged 35 - 49 years and the two groups were matched by age, educational level, and occupational status. The inclusion criterion was a diagnosis of comorbid PTSD and mild to moderate depression according to the diagnostic and statistical manual of mental disorders-fourth edition-text revision's (DSM-IV-TR) diagnostic criteria. The exclusion criteria were psychosis, bipolar disorder, depression symptoms due to a disease, and substance dependency. All participants were employed and were received psychiatric treatments at the baseline. A clinical psychologist with Master's degree interviewed the participants using the structured clinical interview for DSM-IV (SCID) to ensure the accuracy of the diagnosis mentioned in the patients' medical records. Participants were monitored in terms of personality disorder, while there were personality traits in them, there was no evidence of a disorder. The sample size was calculated based on the study of Yazdanimehr et al. (14), assessing the impact of MBCT on the QOL of pregnant females; their results showed a  $5.58 \pm 4$  point increase in the scores for the intervention group and a  $2.06 \pm 3$  point decrease in the scores for the control

group. With confidence interval (CI) of 95% and power of 90%, the minimum required sample was calculated as 26 individuals.

### 3.2. Intervention

The treatment protocol for the experimental group was designed using the MBCT for depression by Segal et al., and the MBSR curriculum developed by Jon Kabat-Zinn. The protocol consists of eight weekly sessions of approximately two hours each and the intervention was conducted by an experienced clinical psychologist in the field of mindfulness-based methods. The drop out was defined as participation in less than six sessions of total eight sessions, and according to the definition, there were no drop outs in this program.

The protocol details were explained to the subjects in the preliminary interview session. Meanwhile, the control group continued their treatment as usual (TAU) which included taking medication for depression and anxiety prescribed by their psychiatrists. The instruction of the combined treatment sessions is briefly shown in Table 1.

**Table 1.** Contents of the Treatment Sessions

Session	Contents of Each Session
1	Psycho-education about depression and mindfulness-based approach / the concept of awareness (introducing the body scan)
2	Mindful self-efficacy, body-scan meditation, reviewing homework, training the concept of mindfulness, awareness and autopilot, registering automatic thoughts, and cognitive distortions, homework
3	Behavioral activation, understanding the relationship between mood and pleasurable activities, being mindful in the present moment, recognizing symptoms of relapse in depression, homework
4	Understanding avoidance and dealing with it, sitting meditation, reviewing homework, understanding the concept of avoidance and facing with what is avoided, awareness of thoughts, feelings and body sensations, homework
5	Sitting meditation, training that thoughts are not facts, see what is going on in the mind, reacting to thoughts and feelings is not the only way to communicate with them, stress: responding vs. reacting, one minute breathing
6	Stay away from thoughts and being at the present moment, attention to the cognitive, emotional and physical markers, dealing with difficult emotions/sensations, rain meditation
7	Modifying dysfunctional beliefs through offering alternative ways to relate with life (acceptance), deliberately bring problems to the mind and build different relationships with them, mindfulness in communication (interpersonal mindfulness)
8	Review of past stories, action plan for prevention of relapse, using what was learned to deal with next mood states

### 3.3. Ethical Considerations

The current study protocol was approved by the Ethics Committee of Kashan University of Medical Sciences (ethical code: 3615; the project code: 9076). All the subjects

signed a written informed consent before participating in the study. Participants were informed about the voluntary nature of their participation and their right to withdraw from the study at any time. They were also assured of confidentiality of the data. The researchers did their best to respect participants' rights according to the Declaration of Helsinki.

### 3.4. Data Analysis

Statistical analysis was performed with SPSS version 13. To compare the two groups in terms of demographic variables, chi-square test for categorical variables and *t*-tests for continuous variables were used. Since the two study groups were independent, the analysis of covariance (ANCOVA) was used to compare the two groups in pre/posttest scores; the assumptions of ANCOVA, such as normal distribution of variables, homogeneity of variance, and homogeneity of regression slopes were evaluated for both groups. *P*-values < 0.05 were considered significant for all tests.

### 3.5. Measures

#### 3.5.1. Structured Clinical Interview For DSM-IV (SCID-I)

The structured clinical interview for DSM-IV axis I disorders (15) is a diagnostic test used to determine DSM-IV axis I disorders (major mental disorders). The instrument is designed to be administered by a clinician or trained mental health professional. The SCID is broken down into separate modules corresponding to categories of diagnoses. Most sections begin with an entry question that would allow the interviewer to skip the associated questions if not met. For all diagnoses, symptoms are coded as present, subthreshold, or absent. Sharifi et al.(16), calculated psychometric properties of the questionnaire for the Iranian population. Diagnostic agreement with clinical interview by two psychiatrists according to Kappa index was above 0.6. Total Kappa index for all current diagnoses was 0.52 and for lifetime diagnoses was 0.55.

#### 3.5.2. Beck Depression Inventory-2 (BDI-II)

It is the new version of a 21-item, self-report questionnaire to assess the severity of depression in adults as well as adolescents above 13. The items of this questionnaire are scored from 0 - 3 ranging from lack of a special symptom to the highest degree of that symptom. The maximum score is 63, which means that the subject has the highest depressive symptoms. The inventory categories are as follows: 0 - 13 means minimum depression, 14 - 19 means mild depression, 20 - 28 means moderate depression, and 29 - 63 means severe depression. The reliability coefficient for all the 21 items were 0.913, and for the construct validity of the

questionnaire correlation between the BDI-II and depression scale of brief symptom inventory was 0.87 (17).

### 3.5.3. The 12-Item Short Form Health Survey (SF-12)

This questionnaire involves 12 questions pertaining to eight dimensions of physical functioning, role limitation due to physical problems, role limitations due to emotional problems, vitality, mental health, social functioning, bodily pain, and general health. According to the questionnaire, the minimum and maximum possible scores for the QOL dimensions and the general QOL range from 0 to 100. This means that 100 is the best and 0 is the worst QOL score. Rohani et al. (15), reported good psychometric properties for SF-12 among 289 Iranian healthy people. Content validity index for the scale (85.6%) and face validity of the instrument were acceptable. Also, physical and mental components were significantly ( $P < 0.001$ ) correlated to the sense of Coherence scale ( $r = 0.27$ ,  $r = 0.68$ ) and health index ( $r = 0.49$ ,  $r = 0.67$ ). Cronbach's alpha values and the intra-class correlation coefficients were  $\geq 0.70$  and  $\geq 0.60$ , respectively.

## 4. Results

There was no dropout in the two groups; therefore, all the study participants were included in the statistical analysis. Demographic characteristics of the two groups are listed in Table 2. The results of *t*-test for continuous variables and chi-square test for categorical variables indicated no significant differences between the two conditions in terms of demographic variables. The results are shown in Table 2.

As Table 3 depicts, the mean BDI score of the intervention group decreased from 29.03 (indicating severe depression) to 19.8 (indicating mild depression) based on the BDI-II, while for the control group, the mean BDI score of 24.6 in the pretest had a slight increase in posttest and reached 25, both in the range of moderate depression. These differences were statistically significant at  $P < 0.0001$  level.

In terms of QOL, the results shown in Table 3 indicate a 50-point increase in the total score of QOL for the intervention group (from 310.8 to 360.4), while for the control group, there was even a reduction in the total score. In terms of the dimensions of variables, Table 3 shows a significant increase from pretest to posttest in mental health and social functioning scores for the intervention group compared with the control group, and the other subscales remained unchanged or without substantial differences.

**Table 2.** Demographic Variables in Case and Control Groups

Variable	Case Group, No. (%)	Control Group, No. (%)	P Value
<b>Age, years</b>			0.956
35 - 39	8 (25.8)	7 (22.6)	
40 - 44	21 (67.7)	22 (71)	
45 - 49	2 (6.5)	2 (6.5)	
<b>Educational level</b>			0.50
Diploma	16 (51.6)	15 (48.4)	
Academic education	15 (48.4)	16 (51.6)	
<b>Occupational status</b>			0.61
Employed	22 (71)	22 (71)	
Jobless	9 (29)	9 (29)	
<b>Marital status</b>			0.754
Married	30 (96.8)	30 (96.8)	
Single	1 (3.2)	1 (3.2)	

## 5. Discussion

The present study aimed at investigating whether a blend of MBCT and MBSR methods could be successfully utilized to decrease the depression symptoms and improve the QOL in patients with PTSD. As the results showed, veterans participating in the mindfulness-based treatment considerably changed in terms of depression and QOL after the eight intervention sessions. The significant relief in depression symptoms observed in the intervention group was in line with that of the study by Kearney demonstrating the effectiveness of a MBSR program to decrease the depression symptoms and improvement of QOL status in patients with PTSD (2). It is also in accordance with the studies showed the impact of mindfulness-based intervention on depression symptoms (14, 18).

Despite lots of commonalities in theory, each of the MBC and MBSR methods has its own specific techniques, including interventions that target anxiety symptoms and the ones preventing the emergence of recurrent episodes of depression (19). The changes observed in the intervention group could be attributed to several factors resulted from the combination of the two methods.

As mentioned earlier, it seems that comorbidity of PTSD and depression could be best explained by an underlying stress factor or a feature of mixed PTSD and depression symptoms (20). Therefore, it is better that interventions focus on the common elements of both disorders (21, 22).

For example, patients with PTSD typically report deficits in the metacognitive monitoring of memories

**Table 3.** Analysis of Covariance on Depression and Quality of Life Between the Two Groups

Variable	MBSR, Mean $\pm$ SD		TAU, Mean $\pm$ SD		P Value
	Pre	Post	Pre	Post	
Depression	29.03 $\pm$ 11.01	19.8 $\pm$ 12.4	24.6 $\pm$ 6.8	25 $\pm$ 5.8	0.001
Quality of life (total score)	310.8 $\pm$ 79.9	360.4 $\pm$ 76.4	324.1 $\pm$ 66.4	316.6 $\pm$ 54.5	0.03
Physical functioning	50 $\pm$ 25	54.3 $\pm$ 25.08	54.8 $\pm$ 29.1	51.6 $\pm$ 21.3	0.223
Role limitation physical problems	42.7 $\pm$ 22.5	48.3 $\pm$ 24.9	40.3 $\pm$ 20.08	50 $\pm$ 19.3	0.549
Role limitations emotional problems	16.93 $\pm$ 19.7	25.8 $\pm$ 35.6	16.12 $\pm$ 20.9	25 $\pm$ 19.3	0.23
Vitality	41.9 $\pm$ 19.7	50.8 $\pm$ 19.8	46.2 $\pm$ 25.6	43.5 $\pm$ 28.1	0.186
Mental health	552.01 $\pm$ 12.5	51 $\pm$ 10.07	52.8 $\pm$ 16.04	46.7 $\pm$ 16.7	0.26
Social functioning	38.7 $\pm$ 26.4	41.1 $\pm$ 23.7	53.2 $\pm$ 27.9	39.5 $\pm$ 21.1	0.05
Bodily pain	29.7.7 $\pm$ 42	45.9 $\pm$ 25.8	35.4 $\pm$ 25.6	20.331.4 $\pm$	0.379
General health	25.8 $\pm$ 1.1	42.7 $\pm$ 18.47	25 $\pm$ 12.9	28.7 $\pm$ 24.08	0.04

and thoughts. These efforts to control the thoughts and mental images related to traumatic events, are experienced in the form of flashbacks, and are similar to an element widely observed in depressive rumination; it consequently leads to thought suppression, avoiding emotional pain, and further pathological loops and symptoms (23). Mindfulness techniques promote acceptance, and welcome the thoughts and mental images related to traumatic events. This method teaches people how to find a new perspective on the events; hence, it could help the patients with PTSD to effectively manage their intrusive thoughts and feelings (3, 4, 11). Emotional acceptance by adopting a non-judgmental stance toward mental experiences provide opportunities for emotional regulation and self-management. Furthermore, repeated facing with unpleasant internal states encouraged in this method, is a kind of exposure that removes negative associations (24).

The MBCT also raises patients' awareness of body reactions and non-verbal behaviors, and helps them regulate their arousal (25). The skills of emotion regulation achieved by mindfulness trainings such as, breathing exercise, distancing from thoughts and emotions, and being at the present moment help the individuals to overcome mood dysregulation and stress via alternative methods they learn.

According to the current study results, the treatment significantly improved some dimensions of the patients' QOL. Chronicity is the dimension greatly influences patient's performance over time. As Steele stated, "Promotion of daily life functioning involves decreasing or eliminating debilitating symptoms of depression, anxiety, and PTSD" (26). Therefore, as the current study results showed, the intervention group significantly improved in terms of two subscales of QOL, namely general health and social func-

tioning, a finding in line with those of the studies reporting the positive relationship of mindfulness with psychological well-being and improvement of communication and participation (27). On the contrary, there was no significant change in functional impairment caused by PTSD assessed by subscales related to role limitations due to physical and psychological problems, and have an important role on the patients' QOL (28).

It can be concluded that, since the present study was cross sectional, it was not adequate to overcome such durable and stable situations caused by the chronic nature of the disorder or the long-term use of medications.

Finally, it was the first study examining the effectiveness of a combined method to reduce depression symptoms comorbid with PTSD in Iranian combat veterans. The current study results suggested that the changes observed in the patients' psychological symptoms can be attributed to addressing their multiple symptoms at the same time. In complex conditions, such as chronic and comorbid mood and anxiety disorders, treatments should be comprehensive and multifaceted, and tailored according to the client's specific needs and impairments. Due to the large number of imposed war's veterans in Iran, as well as veterans affected by war all around the world with disorders similar to those of the participants of the present study, it seems that the combined MBCT and MBSR methods can help to relieve them from their signs and symptoms and transcend their lives.

About the application of the present study findings, it should be noted that in psychiatric nursing, effective interventions for mental illnesses are considerable issues. Mindfulness approaches are innovative treatment modalities in health care that have significant implications for such clinical populations in various contexts such as hos-

pitals and day centers and can be used by psychologists, nurses, and other mental health professionals especially the ones that work at veterans counseling centers (29).

### 5.1. Limitations

Since, it was the first time that the present combined method was evaluated, it would be advisable that this method be applied in a design using three groups rather than MBCT and MBSR alone. Another limitation of the study was that due to the limited number of participants, they were not matched based on factors such as severity and duration of PTSD. It was recommended to consider such issues in subsequent studies.

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### Footnotes

**Authors' Contribution:** In this Study, concept and design, analysis and interpretation of data and supervision and critical revision was done by Abdollah Omid. Drafting of the manuscript, acquisition of data, administrative and material support was done by Sajedah Hamidian, and statistical analysis was conducted jointly by Abdollah Omid and Sajedah Hamidian.

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