



The effectiveness of mindfulness-based stress reduction (MBSR) on anxiety and depression in patients with multiple sclerosis (MS)

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Original Article

Abstract

BACKGROUND: Multiple sclerosis (MS) is a stressful event in life and anxiety and depression are common in these patients. Mindfulness-based stress reduction (MBSR) may help and reduce mood disorders in patients with MS. In this regard, the present study is carried out aiming to evaluate the effect of MBSR on anxiety and depression in women with MS.

METHODS: This was a quasi-experimental study with a control group with the statistical population including all women with MS in Iran MS Society. 30 patients were selected and classified in two groups randomly. The test group participated in MBSR training program for 8 sessions and the control group did not receive this treatment. All patients in the two groups completed depression and anxiety scales before and after the intervention and the data were analyzed by the SPSS software.

RESULTS: The results showed that the two groups were different in the scores of anxiety and depression scales after the intervention ($P < 0.001$).

CONCLUSION: MBSR could reduce anxiety and depression in patients with MS.

KEYWORDS: Mindfulness; Multiple Sclerosis; Mood; Anxiety; Stress; Depression

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Introduction

Multiple sclerosis (MS) is a critical health problem, with problematic progression, comorbidity, complex treatment, and behavioral and social dysfunction.^{1,2} This disease is a highly stressful event for the patients and their families, and may contribute to the forming of anxiety and depression in these patients. Anxiety and depression are prevalent psychiatric disorders in this disease.³ Several studies have shown the efficacy of pharmacological and psychological treatments

for mental disorders in MS.⁴ Among psychological interventions, the cognitive behavioral therapy (CBT) approaches are effective in reducing mood disorders in patients with MS.^{4,5} Mindfulness-based stress reduction (MBSR) is a new approach of behavioral treatments and traditional meditation which is increasingly used in treating mental disorders.⁶ The term mindfulness is often defined as paying attention to the experiences happening in the present moment in a particular way, without judgment about others and acceptance of internal and external experiences.⁷ MBSR could reduce psychological tension.⁸ MBSR is the original model for mindfulness-based interventions (MBIs), first used for people with

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chronic pain⁹ and then for chronic and recurrent mood disorders.¹⁰

Moreover, MBSR could enhance cognitive ability and negative rumination of patients,¹¹ in addition to improving emotion regulation.¹² In a study, Paulik et al. found that the MBSR treatment could lead to reduction of maladaptive coping strategies (such as catastrophizing) in patients with recurrent depression mood.¹³

According to the positive impacts of MBSR on the improvement of mood disorders, the objective in the current study is to examine the effectiveness of MBSR on anxiety and depression in patients with MS.

Materials and Methods

This was a quasi-experimental study with a pretest and posttest design and a control group. The statistical population of the study consisted of all patients with MS referred to Iran MS Society located in Tehran. The convenience sampling method was adopted to select the study subjects. The study inclusion criteria included age between 20 and 40 years, the education level of at least grade eight, a history of MS for at least 5 years, and diagnosis of depression and anxiety due to MS. Besides, the exclusion criteria included lack of schizophrenia and psychotic disorders and no substance and alcohol abuse. All patients referred to the MS Society in 2016 were selected as the study samples. For ethical issues, a written consent form was received from the patients. In the next step, the individuals filled in the anxiety and depression inventories. Among patients with scores higher than 15 in the anxiety inventory and scores higher than 16 in the depression inventory, 30 individuals were classified in the two groups randomly. The test group received the MBSR training for 8 sessions, but the control group did not receive it. After the intervention, both groups filled in the anxiety and depression inventories again. The data were analyzed using

multivariate analysis of covariance (MANCOVA) in the SPSS software (version 22, IBM Corporation, Armonk, NY, USA).

Beck Depression Inventory (BDI): The BDI scale was developed by Beck in 1963 and is employed to measure the intensity of depression. The second edition of BDI (BDI-II) measures the intensity of 21 symptoms of depression on a 0-3 scale. In this scale, scores 0-9, 10-16, 17-29, and 30-60 refer to minimum depression, mild depression, moderate depression, and major depression, respectively.¹⁴ Each item of the inventory measures one symptom of depression. The test-retest reliability of this scale is reported from 48% to 86%, with a mean value of 86% achieved in this study. In Iran, Dabson and Mohammad Khani reported a Cronbach's alpha coefficient of 92% for outpatients and 93% for the students and obtained a one-week test-retest reliability coefficient as 93%.¹⁵

Beck Anxiety Inventory (BAI): BAI was designed to measure the level of anxiety and includes 21 four-option items, with each item reflecting one symptom of anxiety. The scoring style in this scale is from 0 to 3 indicating the options of lack of anxiety, mild anxiety, moderate anxiety, and major anxiety, respectively. The range of total score of anxiety of the BAI scale is 0-61, with scores 0-7, 8-15, 16-25, and 26-63 respectively representing no anxiety, mild anxiety, moderate anxiety, and major anxiety. Beck and Steer reported the internal consistency for this scale as 93%.¹⁶ The test-retest reliability of the scale was obtained as 0.75 in a study in Iran, suggesting a high validity and reliability for this test. In addition, the internal stability of the test was reported to be equal to 92%.¹⁷

Educational package: This package was prepared based on the MBSR skills and using the book by Kabat-Zinn and could be used to implement the 8-session training individually and in the group form (Table 1).¹⁸

Table 1. Mindfulness-based stress reduction (MBSR) training sessions

Session 1	Introducing the rules of group such as confidentiality, and training of mindfulness skill (mindfulness breathing)
Session 2	Body scan practice, being mindful in breathing and mindful walking, three-minute breathing space
session 3	Mindful watching and hearing (focusing as watching and hearing without judgment), sitting meditation, and mindful walking
Session 4	Mindful breathing, sitting meditation, definition of stress and its related body symptoms and body scan exercises
Session 5	Sitting meditation, breathing space, mindful metaphors, introducing the concept of "acceptance", introducing anxiety worksheet
Session 6	Sitting meditation, radical acceptance, monitoring the emotions and thoughts, strengthening observer self (observing the internal events such as thoughts, emotions, and bodily sensation without involvement of them)
Session 7	Acceptance of internal and external experiences and observing of them, behavioral activation (identifying pleasurable daily activities and doing them)
Session 8	Reviewing all prior sessions and giving feedback

The training sessions were hold weekly with each session lasting about 2-2.5 hours. The agenda of the sessions included meditation practices, discussion on relaxation, mindfulness, and awareness. The content of the sessions was as the following:

Results

The participants of the study included 30 patients in the age range of 20-40 years old, moreover 35% and 20% of them had a diploma and post-diploma degrees, respectively and the majority of the participants were in the moderate class of the society economically.

Table 2 shows the mean and standard deviation (SD) of the scores of the variables.

The data in table 3 indicate that intervention and training have led to a significant improvement of the anxiety score between the two groups ($P < 0.001$). Moreover, Eta coefficient is equal to 40%. Given the mean values and descriptive information of both groups, the values of the experimental group have declined from 21.47 to 16.73. In the control group, the value has changed from 21 to 20.73 that is not significant statistically.

Therefore, the intervention has been effective on the anxiety score in the test group.

Based on table 4, the intervention has led to a significant improvement in the depression score in the test group ($P < 0.001$). Moreover, Eta coefficient is equal to 74%. According to mean values and descriptive information of both groups, the values of the experimental group have declined from 21.47 to 17.60. In the control group, the values have changed from 21.47 to 21.74 that is not significant statistically. Hence, the intervention results in the current study has been effective on the depression scores in the test group.

Discussion

This current study showed that MBSR could reduce distress, depression, and anxiety in patients with MS. These results are consistent with those of other studies¹⁹⁻²¹ and indicate the advantages of MBRS in patients with MS. Depression could induce neurological changes in the brain in subjects with MS. MBSR techniques contribute to the reinforcement of the brain that is associated with positive feeling and emotions and improved immunization function.²²

Table 2. Mean and standard deviation (SD) of variables in the pre and posttest stages for the two experimental and control groups

Variables	Experimental group		Control group	
	Pretest	Posttest	Pretest	Posttest
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Anxiety	21.470 \pm 6.968	16.730 \pm 4.350	21.000 \pm 5.182	20.730 \pm 5.007
Depression	21.470 \pm 4.103	17.600 \pm 2.923	21.470 \pm 3.563	21.470 \pm 3.623

SD: Standard deviation

Table 3. Results of multivariate analysis of covariance (MANCOVA) related to training package on anxiety

Variable	Statistical source index	Sum of squares	df	Mean squares	F	P	Eta
Improvement of anxiety	Pretest	413.689	1	413.689	55.246	0.010	0.672
	Treatment effect	137.954	1	137.954	18.423	0.010	0.406
	Error	202.178	27	7.488			

In addition, MBSR may reduce tension, distress, and negative mood by reinforcement of positive emotion regulation skills.²³

Through different mechanisms, MBSR could improve mood disorders in patients with MS. The psychological pain experienced by the patients is the most important cause of negative effect and mood in these patients. In meditation, as the basic approach in MBSR, patients could learn to accept psychological pain with just observing of them. Observing and accepting psychological and physical pain could reduce emotional responses (such as negative effect and mood) in patients with MS.⁵ MBSR allows thoughts to come in mind without any resistance or trying for change or control of them. Participants learn to see internal events (such as negative effect and mood, tensions, and thoughts) as transient events rather than the stable experiences. MBSR could affect the acceptance of internal events in patients with MS, which could help them reduce habitual dysfunctional and problematic patterns of thinking and emotions. Furthermore, it offers new strategies to patients for healthy coping with internal events and stressors.²⁴ Focusing on breathing is a significant strategy to detach from the problematic internal events. In this strategy and skill, patients could drop and break the

cycle of rumination, distress, depression,²⁵ worry, anxiety, stress, pain, and sleep.²³⁻²⁵ The MBSR program teaches patients how to accept and be aware of the internal experiences and life stressors. MBSR exercises help people appropriately cope with stressors.⁵ MBSR exercises could increase the ability of patients to tolerate negative effects and enable them to deal with negative mood and stress effectively.²⁵

Conclusion

The results of the current study showed that MBSR could affect reducing negative outcomes and tensions in patients with MS. Given these results, MBSR could be applied as a strategy to reduce negative effects and moods in patients with MS.

Conflict of Interests

Authors have no conflict of interests.

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Table 4. Results of multivariate analysis of covariance (MANCOVA) related to training the educational package on depression

Variable	Statistical resource index	Sum of squares	df	Mean squares	F	P	Eta
Improvement of depression	Pretest	265.836	1	265.836	191.416	0.010	0.876
	Treatment effect	112.133	1	112.133	80.742	0.010	0.749
	Error	37.497	27	1.389			

Df: Degree of freedom

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