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Effectiveness of Mindfulness-Based Stress Reduction (MBSR) In Stress and Fatigue in Patients with Multiple Sclerosis (MS)

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ABSTRACT

Multiple sclerosis (MS) disease can lead to creation of mental and behavioral disorders such as stress and fatigue. Controlling the problems in patients is essential. Hence, this study has considered effectiveness of mindfulness-based stress reduction in stress and fatigue symptoms in patients with multiple sclerosis (MS). This study is in kind of semi-experimental research in form of pretest posttest pattern with control group. Statistical population of the study consists of all patients with multiple sclerosis referred to Iran MS Association by 2016. Sampling method in this study is available sampling and based on having inclusion criteria. Among patients who gained point higher than 21.8 in stress inventory and point higher than 5.1 in fatigue inventory, 30 people are selected as sample randomly and are placed in 2 groups with 15 people in each group. The experimental group was placed under mindfulness-based stress reduction (MBSR) training course including 8 sessions with 2hrs per session. However, no intervention was done in control group. All patients in experimental and control groups fulfilled stress and fatigue inventories before and after intervention. Obtained data was analyzed using MANCOVA and in SPSS22 software. Obtained results show that there is significant difference between the two groups in terms of stress and fatigue after intervention ($p < 0.001$). According to obtained results, it could be found that treatment method of mindfulness-based stress reduction can help reduction of symptoms of stress and fatigue in patients with MS.

Key words: mindfulness-based stress reduction, stress, fatigue, multiple sclerosis (MS)

INTRODUCTION

Multiple sclerosis (MS) disease is one of the relatively chronic disease and the most common disease corrupting myelin sheath of nerve cells in the central nervous system [1]. National MS Society has declared by 2011 that more than 2.1 million people at the world suffer from MS [25]. Iran is one of the relatively common areas of MS. The amount of prevalence of the disease in Iran is about 15-30 out of 100,000 people despite to the less statistics reported among Asian people (3-5 people per 100,000 people) [28].

Fatigue is common symptom of MS, which can be defined in form of lack of physical or mental energy perceived by others and interfered in daily activities [16]. Fatigue in MS patients can reduce quality of life, especially in physical dimensions [26]. In a study conducted by Merkes (2010), obtained results showed that mindfulness can be useful in order to treat chronic fatigue syndrome. The researches have supported the result that mindfulness-based stress reduction can have positive impacts on different components such as straining mindfulness, improvement of mood, meeting fatigue and anxiety [39]. Moreover, relevant studies have demonstrated that the plan of mindfulness-based

stress reduction can affect improvement of mental, physical and emotional well-being [12], improvement of sleep quality (Shapiro et al, 2003), emotion regulation and distress control [37]. Studies have demonstrated that mindfulness can improve mood and short-term training of mindfulness can lead to reduction of fatigue and anxiety [39,5] in patients with MS.

As stress is inseparable part of human life, there are some plans to cope with stress and control it effectively called as stress management[2]. Increasingly, researches refer to usefulness of mindfulness in cases such as Post-traumatic stress disorder[36], stress, anxiety and depression [14;32;21;23;24,13,11]have shown that training mindfulness can reduce stress.

Main mechanism of mindfulness is controlling attention. Repetitive focusing of attention on a neutral incentive such as breathing can result in calmness[31]. Mindfulness-based stress reduction (MBSR) plan can enhance mindfulness, well-being and reduction of stress and physical and psychological symptoms. Hence, it could be used to raise psychological performance and reduction of stress symptoms in patients [6].

According to abundant positive effects of mindfulness-based stress reduction on well-being and improvement of mental disorders in different patients (especially patients with MS), the main purpose of this study is to investigate effectiveness of MBSR in reduction of stress and fatigue in MS patients.

MATERIALS AND METHODS

This study is in kind of semi-pilot research in form of pretest posttest plan with control group. Statistical population consists of all patients with multiple sclerosis (MS) referring to Iran MS Society in Tehran by 2016. Sampling method is available sampling and based on having inclusion criteria. Inclusion criteria are as follows: having age of 20-40 years old; having at least 8 literacy grades and background of MS disease at least for 5 years. Exclusion criteria also included suffering from schizophrenia and psychotic disorders, drug and alcohol abuse and having other types of psychotherapy. In this regard, all people referred to MS Society during first quarter of the year and had inclusion criteria were selected as sample individuals. Because of ethical considerations, written consent letter was received from the volunteers to participate in the study. These individuals fulfilled stress and fatigue inventories in next step and among them, 30 people of those with points higher than cut off point to 21.8 in stress inventory and higher than 5.1 in fatigue inventory were selected randomly. Then, the individuals were grouped in 2 groups with 15 people in each. Experimental group received 8 sessions of intervention with the subject of mindfulness-based stress reduction (MBSR) and control group remained in waiting list. After the intervention, both groups fulfilled stress and fatigue inventories once again. Obtained data were analyzed using covariance analysis of variance (MANCOVA) and using SPSS-22 software.

Instruments

Cohen Perceived Stress Scale: perceived stress scale includes 14 items to measure thoughts and emotions of individuals during last month. In this study,14-item version of this scale is used. Scoring style of the scale is based on Likert 5-point scale in form of never (0), almost never (1), sometimes (2), most of the times (3) and many times (4). Items 4, 5, 6, 7, 9, 10 and 13 were scored reversely and included options from never (0) to many times (4). The lowest point is 0 and the highest point is equal to 56. Cut off point in this scale is equal to 21.8 and gaining higher point refers to higher perceived stress. Reliability coefficient of internal consistency of the scale is reported in range of 84-86% based on Cronbach alpha in two groups of students and a group of smokers. The perceived stress scale is significantly correlated to life events, depression and physical symptoms, utilization of health services, anxiety and low life satisfaction[8]. Duran et al (2006) has obtained Cronbach alpha for this scale to 74%. Salehi Ghadri (1994) has reported Cronbach alpha o 75% for reliability of this test. Content validity of the scale is also confirmed by 10 expert professors of Mashhad University of Medical Sciences[19].

Fatigue severity scale (FSS): FSS was made on 1988 by a neurologist called Krupp with the purpose of measurement of fatigue in MS patients. This scale is one of the most varying scales to measure fatigue severity in patients with MS. The scale measures fatigue generally and rapidly in these patients. The point obtained from the scale is in consistence with severity of fatigue in the patients. The scale is understandable for all patients and 98% of the participants can answer the questions in this scale. The scale contains 9 items. Point of each item is in range 1-7. Point 1 means that person disagrees with the item and 7 means that the person totally agrees with the item. Total point is obtained through division of total addition of points to 9. This point is also in range 1-7. Point 7 refers to highest fatigue level and point 1 refers to lack of fatigue. People with MS-derived fatigue have usually a point about 5.1 and those without fatigue usually gain point about 2.8. Fulfilling the scale takes 5 minutes or less and patients should answer the questions based on two recent weeks[33;10]. Crupp et al (1989) have reported Criterion validity of the scale to 68% and have reported its internal consistency to 88%. Evaluation of scale reliability is done by

Shahvarooghi and Farahani et al (2009) in Iran. In this study, internal consistency of FSS items are reported to 0.96 based on Cronbach alpha and this shows that items of the mentioned scale evaluate a single item. Moreover, intra-class correlation (ICC) coefficient is estimated to 93% that shows good Repeatability of Persian version of the FSS. Moreover, Atashzadeh et al (2007) and Bastani et al (2012) have determined content and face validity and reliability of this scale using internal consistency method using Cronbach alpha ($r=88\%$)[3,4]

Educational package

This package is provided based on MBSR approach and from book of Kabat-Zinn J (2003) which is implemented in form of an 8-week schedule in group. Sessions are hold weekly and each session lasts about 2-2.5hrs. Agenda of the sessions includes meditation skills practice, discuss on stress, coping strategies and homework and various meditation skills are trained. Content of sessions is as follows:

Session 1: autopilot: this step includes implementation of pretest and posttest and introducing the participants and short explanation of 8 sessions. In this step, the practice of training mindfulness and autopilot is discussed. Also, the practice of eating raisins is proposed. The participants were asked to do raisin practice as homework at home and as daily activity.

Session 2: facing the obstacles: in this step, firstly body checking meditation was taken and then, homework of last session was checked. Also in this session, the obstacles and mental mechanisms and their impact on life are discussed. Finally, body checking practice and mindful breathing was taken. At the end of session, homework was given.

Session 3: breathing with presence of mind: after checking homework of last session, 3-min breathing practice and sitting meditation practice was taken including presence of mind in present time, conscious breathing and awareness of body. Finally, homework was given.

Session 4: remaining in present time: after checking homework of last session, 5-min practice of watching and listening was taken and breathing mindfulness and body checking was also done. Finally, homework was given.

Session 5: permission of presence: after checking homework of last session, sitting meditation and breathing practice was taken and then, some explanations were presented about stress and in continue, Awareness of emotions, thoughts and physical sensations practice was done. Finally, homework was give.

Session 6: thoughts are not reality: after checking homework of last session, practice of observation of thoughts and accepting them was taken. Moreover, sitting meditation practice (perfect presence of mind about internal experiences such as thoughts and physical sensations and external practices such as outside noise) was taken.

Session 7: I can take care of myself in best manner: after checking homework of last session, a combination of practices of last sessions was taken such as 3-min breathing and sitting meditation. Sleep health was trained and a list was provided of enjoying activities with the help of patients. Then, the patients were asked to consider these activities in their schedule. Finally, homework was given.

Session 8: acceptance and change: after checking homework of last session, body checking practice and 3-min breathing was taken. Then, all practices of last session were reviewed. Finally, posttest was implemented[20].

RESULTS

Participants in this study consisted of 30 people in age range of 20-40 years old. In terms of education level, 35% had diploma; 20% post-diploma; 25% BA and 20% had MA degree. In terms of economic class, the patients were in mid class of society. Then, the table of mean value and standard deviation of variables in pretest and posttest of both experimental and control groups is presented.

Table 1: mean value and sd of variables in pretest and posttest of two experimental and control groups

	Experimental group				Control group			
	Pretest		Posttest		Pretest		Posttest	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Stress	31.87	5.263	24.87	3.461	29.67	4.515	28.87	4.389
Fatigue	4.7933	1.06869	3.5267	0.79504	4.4133	0.95309	4.2333	1.01465

Table 2: MANCOVA results related to training educational package on stress

Variable	Statistical source index	Sum of squares	df	Mean squares	F	Sig	Eta
Stress improvement	Stress	210.122	1	210.122	24.955	0.01	0.480
	Group	194.591	1	194.591	23.110	0.01	0.461
	Error	227.345	27	8.420			

The data in table 2 show that considering values of pretest as covariate, the educational intervention can lead to significant difference between stress points of experimental and control groups ($p < 0.001$). Moreover, Eta coefficient is equal to 46%. According to mean value and descriptive specifications of two groups, points of experimental group is declined to 24.87 from 31.87 and the reduction has been from 29.67 to 28.87 in control group that is insignificant statistically. Therefore, it could be found from table 2 that intervention of MBSR has affected stress in experimental group.

Table 3: results of MANCOVA related to training educational package on fatigue

Variable	Statistical source index	Sum of squares	df	Mean squares	F	Sig	Eta
Fatigue improvement	Fatigue	19.576	1	19.576	143.389	0.01	0.842
	Group	7.526	1	7.526	55.127	0.01	0.671
	Error	227.345	27	8.420			

Table 3 shows that through considering values of pretest as covariate, the educational intervention can lead to significant difference between fatigue points of experimental and control groups ($p < 0.001$). Moreover, Eta coefficient is equal to 67%. According to mean value and descriptive specifications of two groups, points of experimental group is declined to 3.52 from 4.79 that is significant statistically and the reduction has been from 4.41 to 4.23 in control group. Therefore, it could be found from table 3 that intervention of MBSR has affected fatigue in experimental group.

DISCUSSION

Obtained results from the study show that mindfulness-based stress reduction can affect reduction of stress and fatigue in patients with MS. The result is in consistence with findings of Merkes (2010) showing that mindfulness is effective in treatment of chronic fatigue syndrom and with findings of Zeidan et al (2010) showing that MBSR can have positive effects on different components such as mindfulness, mood improvement, meeting fatigue and anxiety and with findings of Bohlmeijer (2010) showing that mindfulness can improve mood and reduce fatigue and anxiety. Obtained results from this study have been also in consistence with findings of Smith et al (2011) showing that mindfulness can affect Post-traumatic stress disorder and with findings of Joo et al (2005), Schreiner and Malcolm (2008), Masuda A., & Tully (2012), McManus et al (2012) and Morone et al (2012) showing that mindfulness training can affect stress, depression and anxiety and with findings of Garland and Fernandez et al (2011) and Crane (2009), which confirmed that mindfulness can help stress reduction.

Moreover, obtained results from this study have been in consistence with findings of Flugel et al (2010) showing that mindfulness stress reduction can be effective in improvement of mental, physical and emotional well-being and with findings of Song et al (2015) showing that mindfulness-based stress reduction can affect emotion regulation and distress control. In regard with discriminating the mentioned results, it should be mentioned that mindfulness-based stress reduction (MBSR) is a psychological intervention that helps high presence of mind in individuals. In MBSR, people learn to accept any kind of experience with an open mind instead of judgment and accept and observe the bitter emotions and unpleasant thoughts instead of tolerating stress to leave them. Mindfulness and presence of mind is a novel method instead of automated guidance that can be along with reduction of stress.

CONCLUSION

Obtained results from this study showed that effectiveness of MBSR method in reduction of stress and fatigue of MS patients is confirmed and there is significant difference between two experimental and control groups. Obtained results from this study can pave the way for authorities to set some comprehensive plans to control stress and to prevent sleep problems in MS patients.

Limitations and suggestions

This study has been conducted on women and it is suggested to conduct further studies on men and larger size of sample should be also examined and this kind of intervention should be compared to other types of psychological interventions.

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