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The Effectiveness of Yoga Therapy in Reducing Anxiety, Stress and Depression in Women with Multiple Sclerosis

Janalipour Khadije (MSc)[1], Kafi Mousa (PhD)[2], Hatamian Hamidreza (MD)[3], Rezapour Parisa (MSc)[4]*

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- ***Anxiety, stress and depression can be reduced in MS patients by yoga***
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****Corresponding author:***
Faculty of Literature and Human Sciences, Urmia University, Urmia, Iran

Email:
khadijejanalipour@gmail.com

ABSTRACT

Background: Multiple sclerosis (MS) is a progressive chronic neurologic disorder which topically causes the destruction and inflammation of the myelin sheath in the brain and the spinal cord. It also affects the patient's emotions and can be treated using complementary medicine.

Objectives: The present study was conducted to investigate the effectiveness of yoga therapy in reducing anxiety, stress and depression in MS patients.

Materials and Methods: The present experimental case-control study was conducted using a pretest-posttest approach. The statistical population comprised female MS patients in Rasht, Iran in 2016, 30 of whom were randomly assigned to the control and experimental groups. The experimental group underwent yoga therapy for three months. The two groups completed the depression anxiety stress scale (DASS-21). All the data obtained were analyzed in SPSS-21. $p<0.05$ was set as the level of statistical significance.

Results: The repeated measures ANOVA showed that yoga therapy significantly reduces anxiety, stress and depression in MS patients ($p<0.05$ for all).

Conclusion: The results of the present study revealed that yoga therapy can be widely used as an effective and efficient method to improve the symptoms of anxiety, stress and depression in MS patients. This method can prevent the increasing debilitation in MS patients and help them improve their mood and overcome their anxiety.

Keywords: Multiple Sclerosis; Yoga; Anxiety; Depression

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1. *Faculty of Literature and Human Sciences, Urmia University, Urmia, Iran*
2. *Professor of Psychology, Faculty of Medicine, University of Guilan, Rasht, Iran*
3. *Neurology Department, Poursina Hospital, School of Medicine, Guilan University of Medical Sciences, Rasht, Iran*
4. *Faculty of Psychology and Educational Sciences, Allameh Tabataba'i University, Tehran, Iran*

Introduction

Multiple sclerosis (MS) is a progressive chronic neurologic disorder which topically causes the destruction and inflammation of the myelin sheath in the brain and the spinal cord, thus affecting the sensorimotor skills. This

disease has a chronic course (1), mainly affects people between 20-40 year olds and its prevalence in women is 1.3-4.1 times that in men. MS may be relapsing-remitting, primary progressive, secondary progressive or progressive relapsing-remitting, which affects 65%-80% of MS patients. According to the 2016 report of Iran MS society, around 75000-80000people suffer from MS in Iran, with a prevalence of about 50 per 100000. After or sometimes before the first attack of the disease, psychological symptoms may appear. The clinical symptoms of MS include limbs paralysis, fatigue, tremor, pains, bladder and bowel dysfunction, spasm, visual impairment and sexual dysfunction (2). MS patients suffer from very higher levels of psychological problems such as depression, stress and anxiety as well as cognitive disorders, irritability and anger compared to healthy people. These symptoms may be a direct result of the inflammation and demyelination of nerves or caused by the psychological impacts of this unpredictable chronic disease (3). Approximately 48% of MS patients experience anxiety, stress and depression within the first year of diagnosing the disease. Research suggests that 56%-60% of MS patients suffer from depression and 37%-40% from anxiety. These symptoms are associated with social dysfunction, suicidal thoughts and increasing the number of relapses seriously degrade the patients' quality of life (4-7). As a multidimensional and multifactorial phenomenon, stress can be considered a complication of MS as well as a factor contributing to the aggravation or relapse of symptoms. Moreover, stress can be life threatening in MS patients and leads to divorce, job loss and family conflicts (5). Depression is the most common mood disorder in MS patients, with a reported prevalence of 50% (3,6). A study reported a high prevalence of health-threatening factors such as stress, anxiety and depression in Iranian MS patients. Proper training programs were therefore recommended to be used to cope with or adapt to these symptoms in MS patients (8). Many MS patients believe that they can play a more effective role in their life by doing their best to manage their own problems. By taking steps in self-care, MS patient may be enabled to overcome the disease symptoms and their emotional changes and learn the skills required for daily activities (9). Complementary therapies are holistic and are used to improve the physical and psychological well-being of patients. These therapies are highly beneficial to MS patients and widely used by them (10). Recent studies suggest that, owing to the side-effects of pharmacotherapy, MS patients often tend to seek a complementary and alternative therapeutic method to help them manage the disease (11). Formerly disregarded yoga therapy is a complementary alternative treatment with a long history, which has recently been used widely to treat diseases (12). Yoga practices enhance the activity of brain and reduce cortisol levels. These physical and chemical changes can help reduce anxiety, stress and depression (7). Yoga therapy modifies the central nervous system function and therefore reduces sympathetic activities and causes neuromuscular relaxation (13). Yoga and meditation were found to be positively associated with reducing anxiety and stress, although the reduction is not constant, requiring the exercises to be continued. Yoga was recommended to be used as a complementary medication along with pharmacotherapy in MS patients (14). Despite the effectiveness of pharmacotherapy in

immediate recovery from MS symptoms, many of the MS patients were found to be seeking a complementary alternative therapy such as mindfulness and yoga, which were shown to positively affect MS symptoms including depression and physical and motor disabilities (15). Despite addressing yoga therapy in a few studies in Iran, the effectiveness of yoga therapy in reducing anxiety, stress and depression in MS patients has not been yet addressed. Given the increasing number of MS patients and the associated psychological problems the present study was conducted to investigate the effectiveness of yoga therapy in reducing anxiety, stress and depression in MS patients. Also this study examined the stability of this intervention over time, which was investigated at a two-month follow-up. The findings of this study can confirm the necessity of performing a proper intervention to alleviate the symptoms associated with MS and to bestow the patients a better quality of life. Because the patients want a better adaptation to the disease and its outcomes by alleviating these problems.

Materials and Methods

The present experimental case-control study was conducted in 2016 using a pretest-posttest approach and a two-month follow-up. The statistical population included all patients diagnosed with MS by a neurologist in Rasht, Iran and covered by Guilan MS society, including 202 men and 546 women. The patients whose disease had been diagnosed in 2011-2016 were sent a notification through a text message. Of a total of 60 candidates who were willing to participate in the study, 30 were randomly selected, assigned to the experimental group (n=15) and the control group (n=15) and were pretested. The experimental group underwent yoga therapy by a yoga expert as per the treatment protocol. The eligible candidates included 20-40-year-old women, who were not participated in yoga classes for at least one year and did not use wheelchairs. The exclusion criteria comprised being hurt by yoga exercises and using other complementary therapies.

Depression, Anxiety, Stress scale (DASS)-21

DASS was developed by Lovibond and Lovibond (1995). This scale has two forms including a long 42-item form comprising three 14-item scales each measuring a psychological factor or construct. DASS-21 was validated by Sahebi *et al.* (2005) in the Iranian population and its reliability was confirmed by experts. Lovibond and Lovibond (1995) found a significant correlation between Beck's Depression Inventory and DASS (r=0.4) in a large sample including 717 university students. Moreover, Antoni *et al.* (1998) obtained similar patterns of correlation in clinical samples.

DASS is a self-administered questionnaire scored on a four-point Likert scale ranging from "never" to "always"; participants mark the selected options in the questionnaire (16).

The therapeutic protocol

The experimental group attended twenty-four 60-75-minute yoga sessions, 2 sessions a week, supervised by a yoga expert. The exercises encompassed a combination of 35-40 minutes of dynamic Asana exercises, 10-15 minutes of respiratory pranayama exercises, 15-20 minutes of meditation (relief) followed by relaxation. Asana comprised stretching exercises including abdominal

stretching and Parivrtta Trikon asana (Revolved Triangle Pose), warm-up exercises, i.e. Pavanamukt asana and balance exercises (Natarajasana, Verikshasana), which involve nearly all muscles. Pranayama exercises were performed in a sitting position, with the spine straight and stretched, by controlling the proportion of inhalation, breath-holding and exhalation durations. Practical breathing in pranayama encompassed full breath, sun-piercing breath, moon-piercing breath, honeybee breath, cooling breath (sitali) and kapalabhati. Meditation involved sitting in a quiet place and focusing on a special topic. Relaxation (shavasana) exercises included relieving and relaxing muscles using the associated incitations. Given the nature and physical and spiritual complications of the disease, the patients were allowed to rest for a specific amount of time depending on the type of the exercise in case they felt exhaustedor imbalanced (17). After collecting the completed questionnaires, the data were analyzed in SPSS-21 using repeated measures ANOVA (assessment was performed by pretest, posttest and follow-up study).

Results

Table 1 presents the mean values of the study variables.

Table 1. The mean pretest, posttest and follow-up values of the study variables

Variable	Group	Pretest	Posttest	Follow-up
Anxiety	Experimental	17.33±7.43	7.07±5.55	9.47±6.99
	Control	17.73±8.88	19.33±8.71	27.46±6.95
Stress	Experimental	22.67±5.79	11.07±5.44	19.20±6.54
	Control	23.87±10.65	25.60±7.90	24.53±6.91
Depression	Experimental	15.73±10.08	5.60±5.51	9.20±9.62
	Control	20.80±12.39	23.60±10.32	30.27±6.13

Given the normal distribution of the study variables (p>0.05) as confirmed by Kolmogorov–Smirnov test, the repeated measures ANOVA was selected to investigate the research subject. The test hypotheses were first examined. The results of M Box's test confirmed the homogeneity of covariance of anxiety, stress and depression (p>0.05).Given the violation of sphericity based on the Mauchly's test of sphericity for anxiety and depression (p<0.05), the degrees of freedom were corrected using the epsilon obtained through the Greenhouse-Geisser procedure (18). The results of the Mauchly's test of sphericity for stress confirmed the sphericity (p>0.05). The results of Levene's test also confirmed the default of homogeneity of variances of anxiety, stress and depression in all time points including pretest, posttest and follow-up (p>0.05).

Table 2. The Between the subject and the subject results of the repeated measured Analysis of variance (ANOVA)

Variable	Factor	SS	DF	F	P	Eta Squared
Anxiety	Time	473.87	1.55	9.39	0.001	0.251
	Time*Group	1208.62	1.55	23.94	0.001	0.461
	Group	2351.11	1	19.86	0.001	0.415
Stress	Time	387.82	2	7.27	0.002	0.206
	Time*Group	698.76	2	13.09	0.001	0.319
	Group	1109.51	1	9.97	0.004	0.263
Depression	Time	419.47	1.58	5.62	0.011	0.167
	Time*Group	1081.69	1.58	14.50	0.001	0.341
	Group	4869.38	1	26.11	0.001	0.483

SS: Sum of Squares, DF: degrees of freedom

Given the three dependent variables in ANOVA and a confidence interval of 95%, the level of statistical significance will be calculated as p=0.016.

Table 2 suggests significant differences among the scores of the factors (pretest, posttest and follow-up) for anxiety, stress and depression (p=0.016). The experimental and control groups are also significantly different in terms of anxiety, stress and depression (p=0.016). Moreover, the interaction of time and group is significant in terms of anxiety, stress and depression (p=0.016). In other words, yoga therapy is more effective in reducing anxiety, stress and depression in the experimental group compared to in the controls.

The post-hoc Bonferroni test was used to examine the pairwise differences in the pretest, posttest and follow-up anxiety scores (table 3).

Table 3. The descriptive statistics associated with the Bonferroni pairwise comparison between the score of anxiety, stress and depression in different measurement time points

Variable		Mean Difference	SSE	*p-value*
Anxiety	Pretest*Posttest	4.33	0.96	0.001
	Pretest*Follow-up	-0.93	1.58	1.000
	Posttest*Follow-up	-5.27	1.29	0.001
Stress	Pretest*Posttest	4.93	1.32	0.003
	Pretest*Follow-up	1.40	1.50	1.000
	Posttest*Follow-up	-3.53	1.16	0.015
Depression	Pretest*Posttest	3.67	1.14	0.009
	Pretest*Follow-up	-1.47	1.87	1.000
	Posttest*Follow-up	-5.13	1.63	0.012

According to table 3, there are significant differences in the pretest and posttest scores of anxiety (p<0.001), stress (p<0.005) and depression (p<0.001) as well as between the posttest and follow-up scores of anxiety (p<0.001), stress (p<0.05) and depression (p<0.01).

Discussion

The present study sought to investigate the effectiveness of yoga therapy in reducing anxiety, stress and depression in MS patients. The results of the pretest and posttest confirmed this effectiveness. Furthermore,

comparing the posttest and follow-up scores revealed more pronounced reductions in anxiety, stress and depression in the experimental stage compared to the follow-up and that these symptoms worsen with the increase in the withdrawal duration of the intervention, emphasizing the extension of the treatment period. The present subject has not been addressed by Iranian researchers; nevertheless, Ghaffari *et al.* (2008) conducted a study to investigate the effect of the progressive muscle relaxation technique on depression, anxiety and stress in MS patients. They found this intervention to slightly reduce anxiety and stress. It can be explained by the complex nature of anxiety and stress in MS patients as well as the effect of different factors such as the debilitating symptoms of the disease including pains, sexual dysfunction, the disease-associated stress and mood and physical disorders, the medication side-effects, the demyelination of neurons and its significant relationship with fatigue (19).

The study conducted by San Jose *et al.* (2016), in Spain showed that mindfulness can improve the quality of life and reduce anxiety, stress and fatigue in MS patients (20). Moreover, Rajesh showed that yoga and meditation are positively associated with the reducing anxiety and stress, although this reduction is not constant, requiring the exercise to be permanent. He also suggested that yoga be used as a complementary medication along with pharmacotherapy in MS patients (14). Although the study conducted by Frank and Larimore confirmed the effectiveness of pharmacotherapy in the immediate recovery of the patients from MS symptoms, it emphasized the patients' demand for complementary and alternative medications such as mindfulness and yoga and the positive effects of yoga on MS-associated symptoms including depression and motor disabilities (21). The clinical investigation of yoga benefits by Field confirmed the psychological effectiveness of yoga on anxiety, depression as well as on physiological parameters (22). Desai *et al.* found yoga to positively affect brain waves and is associated with improvements in cognition, memory, mood and anxiety and reducing amygdala activities and negative emotions (12). Research suggests that using techniques such as yoga and mindfulness, whose main mission is to help with the peace of mind and soul and consciousness, can help patients with chronic diseases such as MS alleviate their anxiety, stress and depression.

Conclusion

Yoga therapy helps patients with their daily activities by offering various techniques such as Asana, which involves different organs such as the head and the neck, eyes, hands and legs and therefore causes muscle smoothness and flexibility. Respiratory exercises (pranayama) also improve the blood and oxygen supply to brain cells. In addition, relaxation enhances comfort and concentration and thus improves psychological and physical well-being. Anxiety, stress and depression can therefore be reduced in MS patients by using yoga exercises and observing the progressive trend of health acquired and their improved ability of doing daily activities. Specialists have failed to apply yoga therapy, although it can be a beneficial complementary therapy along with pharmacotherapy in MS patients. It is hoped that the achievement of the present results will be considered a turning point in the scientific application of this therapeutic method, especially by MS societies, in which

case larger samples can also be used in both genders.

Conflict of Interest

The authors have no conflict of interest.

References

1. Bruce JM, Lynch SG. Personality Traits in Multiple Sclerosis: Association with Mood and Anxiety Disorders. J Psychosom Res 2011;70(5):479-85. doi: 10.1016/j.jpsychores. 2010.12.010.
2. Rajabi S, Yazdkhasti F. The Effectiveness of Acceptance and Commitment Group Therapy on Anxiety and Depression in Women with MS Who Were Referred to the MS Association. Journal of Clinical Psychology 2013; 6(1): 29-38. [Text in Persian]
3. Mrabet S, Ben Ali N, Kchaou M, Belal S. Depression in Multiple Sclerosis. Revue neurologique 2014;170(11):700-2.
4. Tanhaye Reshvanlu F, Soleimanian A. Psychometric Characteristics of Self-Sufficiency Multiple Sclerosis. Journal of Research in Behavioural Sciences 2013; 12(1): 9-18. [Text in Persian]
5. Caleb R. Multiple Sclerosis (Practical Guide for Families). In: Issazadegan A, et al. (eds.) 1st ed. Tehran: Roshd Publication; 2013. [Text in Persian]
6. Fiest KM, Walker JR, Bernstein CN, Graff LA, Zarychanski R, Abou-Setta AM, et al. Systematic Review and Meta-analysis of Interventions for Depression and Anxiety in Persons with Multiple Sclerosis. Mult Scler Relat Disord 2016;5:12-26. doi: 10.1016/j. msard.2015.10.004.
7. Riera A, Torres C. Yoga for Those with Multiple Sclerosis: Exercises to Improve Balance and Manage Symptoms of Pain and Fatigue. Meteor Content Providers; 2015.
8. Dehghan A, Mohammadkhan S, Memarian R. Abundance of Stress, Anxiety and Depression in Multiple Sclerosis Patients. AUMJ 2013; 2 (2) :82-8.
9. Pilkington K, Kirkwood G, Rampes H, Richardson J. Yoga for Depression: the Research Evidence. J Affect Disord 2005;89(1-3):13-24. doi: 10.1016/j.jad.2005. 08.013
10. Guner S, Inanici F. Yoga Therapy and Ambulatory Multiple Sclerosis Assessment of Gait Analysis Parameters, Fatigue and Balance. J Bodyw Mov Ther 2015;19(1):72-81. doi: 10.1016/j.jbmt.2014.04.004
11. Yadav V, Bourdette D. Complementary and Alternative Medicine: Is There a Role in Multiple Sclerosis? Curr Neurol Neurosci Rep 2006;6(3):259-67.
12. Desai R, Tailor A, Bhatt T. Effects of Yoga on Brain Waves and Structural Activation: A Review. Complement Ther Clin Pract 2015;21(2):112-8. doi: 10.1016/j.ctcp.2015. 02.002
13. Velikonja O, Čurić K, Ožura A, Jazbec SŠ. Influence of Sports Climbing and Yoga on Spasticity, Cognitive Function, Mood and Fatigue in Patients with Multiple Sclerosis. Clin Neurol Neurosurg 2010;112(7):597-601. doi: 10.1016/j.clineuro.2010.03.006
14. Rajesh SK. Yoga Psychology: A Handbook of Yogic Psychotherapy. Int J Yoga 2015; 8(1):84.
15. Da Silva TL, Ravindran LN, Ravindran AV. Yoga in the Treatment of Mood and Anxiety Disorders: A Review. Asian J Psychiatr 2009;2(1):6-16. doi. 10.1016/j.ajp.2008.12. 002
16. Sahebi A, Asghari MJ, Salari RS. Validation of Depression Anxiety and Stress Scale (DASS-21) for an Iranian Population. Iranian Psychologists. 2005;4(1):299-313. [Text in Persian]
17. Pilkington K, Kirkwood G, Rampes H, Richardson J. Yoga for Depression: the Research Evidence. J Affect Disord 2005;89(1-3): 13-24. doi: 10.1016/j.jad.2005. 08.013
18. Meyers LS, Gamst G, Guarino AJ. Applied Multivariate Research: Design and Interpretation .In: Farzad V, et al. (eds.). 1st ed. Tahran: Roshd Publication; 2012. [Text in Persian]
19. Ghaffari S, Ahmadi F, Nabavi M, Memarian R. Effect of Progressive Muscle Relaxation on Depression, Anxiety and Stress in Patients with Multiple Sclerosis. Research in Medicine 2009; 32(1):45-53. [Text in Persian]

20. San José AM, Oreja-Guevara C, Lorenzo SC, Notario LC, Vega BR, Pérez CB. Psychotherapeutic and Psychosocial Interventions for Managing Stress in Multiple Sclerosis: The Contribution of Mindfulness-Based Interventions. Neurología 2016;31(2): 113-20. doi.org/10.1016/j.nrleng.2015.07.003
21. Frank R, Larimore J. Yoga As a Method of Symptom Management in Multiple Sclerosis. Front Neurosci 2015;9:133. doi: 10.3389/ fnins.2015.00133
22. Field T. Yoga Clinical Research Review. Complement Ther Clin Pract 2011;17(1):1-8. doi: 10.1016/j.ctcp.2010.09.007