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The effect of motor-balance exercise on MS patients' anxiety and fatigue of Zahedan, Iran 2014-2015

Asadullah Keikhaei[1], Gholam Hosein Sargazi[2], Farshid Saeedinezhad[3]☼, Hamed Faghihi[4], Zeynab Poodineh[5]

1.Dept. of Anesthesia, School of Paramedical, Zahedan University of Medical Sciences, Zahedan, Iran, Email: keykhaei110@yahoo.com
2.Dept. of Anesthesia, School of Paramedical, Zahedan University of Medical Sciences, Zahedan, Iran, Email: ghsargazi1@gmail.com
3.Lecturer, Department of Nursing, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran, Email: farshidsaeedinezhad@gmail.com
4.Dept. of Anesthesia, School of Paramedical, Zahedan University of Medical Sciences, Zahedan, Iran, Email: hamedfaghihi90@yahoo.com
5.Lecturer, Department of Nursing, School of Nursing and Midwifery, Zahedan University of Medical Sciences, Zahedan, Iran, Email: poodineh_68_z@yahoo.com

☼**Corresponding Author:**
Farshid Saeedinezhad,
Nursing and Midwifery School,
Mashahir
Street: Zahedan University of Medical Sciences,
zahedan, Iran.
Post Office Box: 98151926380,
Tel: 98 54 33442482
Fax: 98 54 33442481
Email: farshidsaeedinezhad@gmail.com

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RESEARCH ARTICLE

ABSTRACT

Background and Purpose

Multiple sclerosis (MS) is a progressive and chronic central autoimmune disease of the central nervous system that affects the brain and the spinal cord. MS disturbs the direction of the nervous and electrical currents by destroying the neural cell myelin and forming a specific scar. In addition to physical problems, chronic diseases including MS are responsible for many psychological disorders. The purpose of this study was to investigate the effect of motor-balance exercise on MS Patients' Anxiety and Fatigue of Zahedan, Iran 2014-2015.

Methodology

This is a randomized controlled clinical trial on 60 MS patients diagnosed with MS visiting the MS Center from November 2014 to April 2015. Stratified random sampling was employed and the patients were assigned into two 30-member groups: Group A (Intervention) and Group B (Control). There are three stratifies in each group. Balance exercises are considered the intervention. The questionnaires were forwarded prior to intervention and four weeks after the intervention to assess the anxiety and fatigue. The data were collected by demographic questionnaire, Spielberger State-Trait Anxiety Inventory (STAI), and Brief Fatigue Inventory (BFI).

Findings

According to the results of the present study, patients with MS before intervention had revealed clear anxiety 53.7% at the moderate level, 9.2% were mild, 35% had severe anxiety, and their hidden anxiety was 14.8% mild, 53.7% moderate and 29.6% severe. After the intervention, participants with MS developed their obvious anxiety from 25.2% before intervention to 14.3%, and their secret anxiety decreased from 29.6 to 2.11.

Conclusion

In general, the results showed that balance exercise intervention is possible for MS patients. The exercise causes a significant difference in anxiety and fatigue so that such intervention contributes to reduced anxiety and fatigue. Therefore, such intervention can have positive effect on anxiety and fatigue symptoms and improve the quality of life.

Keyword: Motor-Balance Exercise; Anxiety; Fatigue; MS

1. INTRODUCTION

Multiple sclerosis (MS) is a progressive and chronic central autoimmune disease of the central nervous system that affects the brain and the spinal cord. MS disturbs the direction of the nervous and electrical currents by destroying the neural cell myelin and forming a specific scar (1). In addition to physical problems, chronic diseases including MS are responsible for many psychological disorders (2). Depression and anxiety are among the most common psychiatric disorders of the patients diagnosed with MS. High depression and anxiety rate of MS patients is still unknown. A combination of social, neurological, and MS-related factors is believed to be involved (3). The results of some studies state the fact that stress, anxiety, and depression symptoms of MS patients have a close relationship with relapse and reduced quality of life (4). Almost 3.5 suffer from MS worldwide. MS prevalence is estimated to be 57 per 100.000 people in Iran (5). The MS affects approximately 1 in 1,000 people and has a prevalence of around 1.1 million in the world (6). According to the report by the Iranian Multiple Sclerosis Society, almost 40.000 suffer from MS of which 9.000 have been recorded (7). Chronic diseases including MS are responsible for many psychological disorders (8). As a multifactorial and

multidimensional phenomenon, stress can be a MS complication and an MS's intensification and relapse factor (9). Stress can sometimes be life threatening such as divorce, job loss and family conflicts (10). Major problems related to MS include fatigue, depression, muscle contractions, pain, irritable bladder and sexual dysfunction. MS-related fatigue is lack of abnormal energy that significantly limits individuals' physical and mental abilities, regardless of neurological disability level. This fatigue affects motor and cognitive abilities and can appear as a decrease in energy, feeling unwell, weak motor, and difficulty in maintaining concentration (11). Combined fatigue and depression reduces mobility and exacerbates muscle contractions and pain (12). According to above mentioned issues and high prevalence rate of depression, stress, and anxiety, it is essential to adopt diagnostic tests and psychosocial treatments other than conventional therapies to reduce these symptoms (13) because common drug therapies are not effective in all patients diagnosed with MS. On the other hand, drugs have many complications such as fatigue and psychological imbalance. To eliminate these complications, there are no known, effective treatments (14).

Therefore, on-pharmacological methods have attracted the attention of all patients including MS patients in recent years, known as complementary therapies. Complementary therapies are comprehensive therapies that are used to increase the patient's physical and mental health (15). Relaxation exercises improve MS Patients' coordination and quality of the muscles. A permanent contraction method is beneficial to treat muscle tightness of MS patients (16). Despite the advances in medical science in recent years, no definitive and eradicating treatment has been found for MS. Most existing treatments reduce the symptoms or the progress of the disease. Therefore, rapid detection and diagnosis of MS and its timely control largely control the occurrence of severe complications and its uncontrolled progression (17). MS is more prevalent among the Indian and European rather than the black and yellow races (18). Since the Iranians are a branch of Indian and European race, it is essential to further study MS and offer solutions to cope with the complications. The main question outlined here is as follows: Is the technique effective in reducing MS psychological disorders and reducing the problems? Therefore, the goal of this study is to examine the effect of motor-balance exercise on anxiety and fatigue of MS patients in Iran 2014-2015.

2. METHODOLOGY

This is a randomized controlled clinical trial on 60 MS patients diagnosed with MS visiting the MS Center from November 2014 to April 2015. Stratified random sampling was employed and the patients were assigned into two 30-member groups: Group A (Intervention) and Group B (Control). There are three stratifies in each group. Balance exercises are considered the intervention. The MS patients in intervention group were trained. The questionnaires were forwarded prior to intervention and four weeks after the intervention to assess the anxiety and fatigue. There were two inclusion criteria: Age older than 18 and consent. The questionnaire was administered by the researcher. The data were collected by demographic questionnaire, Spielberger State-Trait Anxiety Inventory (STAI), and Brief Fatigue Inventory (BFI). The demographic characteristics consisted of age, weight, gender, marital status, number of children, job, education, and residential location (This study approved by Ethics committee of Zaheddan University of Medical Science; Ethic code: IT.ZAUMS.REC.1396.367).

Spielberger State-Trait Anxiety Inventory (STAI)

This is a standard tool to assess anxiety, designed and developed by Spielberger. The test consists of 40 items. The items are scored on a 4-point Likert scale, used to measure the subjects' trait and state anxiety. At state mode, the subjects need to express their feelings at the moment (when filling in the forms); however, at the trait mode, they need to point to their general feelings.

Brief Fatigue Inventory (BFI)

The questionnaire has 10 items. The first item characterizes abnormal sleep dusting the past week with Yes or No. The next questions focus on the extent of the current fatigue, general fatigue in the last 24 hours, the greatest extent of fatigue in the last 24 hours, the effect of fatigue in the last 24 hours on the general activity, the ability of walking, communication with others, and life enjoyment. The items are scored on a zero-to-10 scale. Zero shows lack of fatigue while 10 is the greatest level of fatigue. Finally, the total intensity is obtained by total sum of questions 2-9 (9 questions) and then divided by 9. This is a standard scale used in several studies. Extensive studies in Iran and other countries have verified the validity ($r>90\%$). Descriptive statistics were employed to determine the demographic characteristics (mean, frequency, frequency percentage). Analytical statistics (t-test, chi-square, and pairwise t) were employed. The data were analyzed in SPSS 22 and $p<0.05$ was considered.

3. RESULTS

The subjects were assigned into two 30-member groups (experiment and control). Until the end of the study, 6 left the study. Therefore, final analysis was carried out on 54 patients.

Table 1 Comparing Anxiety and Fatigue Dimensions in Control and Experiment Groups of MS Patients in Zahedan, Iran- 2014

Variable	Intervention	Control	T-test
	Mean± Standard Deviation	Mean± Standard Deviation	
Anxiety	53.91±5.6	57.6±6.5	T=27.51,P=0.124
Fatigue	6.1±2.2	6.7±1.9	T=14.28, P=0.438

According to the t-test results, no significant difference was found between control and intervention groups in terms of each of fatigue and anxiety dimensions. The distribution of variables is similar in control and intervention groups.

Table 2 Comparing Demographic Variables (Qualitative) in Intervention and Control Groups of MS Patients in Zahedan, Iran- 2014

Variable	Sub-Section	Intervention	Control	Statistical Test Results
Age	20-35	19 (57.6)*	25(75.8)	χ^2=3.9
	36-50	4 (42.4)	6 (24.2)	
Gender	Female	20 (60.6)	18 (78.7)	χ^2=0.9
	Male	10 (39.5)	7 (21.3)	P=0.052
Marital Status	Single	10 (36.4)	10 (33.3)	χ^2=0.7
	Married	20 (63.3)	13 (69.7)	P=0.672
Education	Below High School Certificate	3 (9.1)	5 (15.2)	χ^2=1.86
	High School Certificate	21 (63.6)	13 (39.4)	P=0.390
	Above High School Certificate	6 (36.4)	5 (25.5)	
Type of MS	Remitting-Relapsing MS	20 (90.1)	30 (90.1)	χ^2=0.54
	Progressive Secondary	1 (9.1)	3 (9.1)	P=0.413
History of Hospitalization	Zero	14 (30.3)	16 (78.7)	χ^2=0.7
	One Time	7 (6.1)	5 (15.2)	P=0.679
	More than Once	2 (3)	2 (6.1)	

*Number (Percentage)

According to the chi-square test, no significant difference was found between the control and intervention groups in terms of demographic variables; however, the difference was significant in terms of gender (P=0.052).

Table 3 The Effect of Motor-Balance Exercise on MS Patients' Anxiety and Fatigue of Zahedan, Iran- 2014

Variable	Group	Mean ± Standard Deviation	
		Before	After
Anxiety	Intervention	56.1±9.1	50.22±8.2
Fatigue	Intervention	6.9±2.1	5.3±1.8
Anxiety	Control	57.2±8.2	57.5±8.4
Fatigue	Control	6.8±2.2	6.9±2.1

Shapiro-wilk test was used to examine the score difference normality (before and after) for fatigue and anxiety of two groups. The results showed that pairwise t-test need to be used to compare the difference before and after the intervention for the

dimensions of fatigue and anxiety. According to the pairwise t-test, a significant difference was found between the scores of fatigue and anxiety dimensions before and after intervention (P=0.05).

4. DISCUSSION

According to the results, prior to the intervention, MS patients had 53.7% medium state, 9.2% minor, and 35% severe anxiety. The trait anxiety accounted for 14.8% minor, 53.7% medium, and 29.6 severe. After the intervention, the state anxiety declined from 25.2% to 14.3% and the trait anxiety declined from 29.6 to 11.2. In this study, anxiety declined in the experiment group compared to the control group. MS is the cause of anxiety in various aspects of the life. Lack of diagnosis, disease unpredictability, concern about treatment costs, individual care inability, and increased cost of treatment are responsible for anxiety. Therefore, using effective intervention such as balance exercises can help decrease such anxiety.

A significant difference was found between the anxiety scores of MS patients before and after intervention so that state and trait decreased significantly in the experiment group compared to the control group. Such significant difference indicates the effect of anxiety decrease after the intervention. The study by Ghafari et al. has proven the effect of muscle relaxation on anxiety and fatigue decrease of MS patients. No significant relationship was found between the anxiety score before the intervention and demographic variables including age, gender marital status, education, and the frequency of relapse, which is consistent with the study by Dehghani et al. on the prevalence of stress, anxiety and depression in MS patients and the study by Ghafari et al. on the effect of Progressive Muscle Therapy on depression, anxiety, and stress of MS patients. The anxiety scores had a relationship with gender. However, age and marital status had no relationship. The results showed that physical and psychological problems are more common in female patients than the male ones (19،23). As a result, reduced quality of life is expected. Paying attention to the complications caused by hard and chronic disease is very important because physical and psychological health can be effective in health and success of treatment (20،24).

The fatigue score of MS patients was reported 61.1% before the intervention. It decreased to 40.5% after the intervention. Such reduction shows the positive effect of intervention and suggests the use of complementary treatment. Anxiety of MS patients is associated with the lack of energy caused by fatigue and physical symptoms. Therefore, applying a method which saves energy seems logical. A comparative study is recommended to determine the effect of regular rest on saving energy or yoga exercises, and muscle relaxation.

A significant relationship was found between the anxiety scores of MS patients before and after intervention so that the fatigue decreased after the intervention. The reduction can be effective in the quality of life of the MS patients and help them improve the tasks and duties. The study by Ghaffari et al. (2008) on the effect of applying Progressive Muscle Relaxation Technique on fatigue of patients diagnosed with MS. The results showed that a significant difference was found between the experiment and control groups at three times (before the intervention, one month after intervention, and two months after intervention).Progressive Muscle Relaxation Technique can reduce the fatigue of patients in intervention group compared to the control group (21،26). The study by Chin et al. (2014) on the effect of yoga on fatigue of hemodialysis patients showed that yoga decreased fatigue (22،25). Our subjects are patients and such reduction can be seen in intervention group after muscle relaxation.

No significant relationship was found between demographic variables and anxiety and fatigue, which are consistent with the study by Patan et al. (2005) and Dehghani et al. (2012).

5. CONCLUSION

In general, the results showed that balance exercise intervention is possible for MS patients. The exercise causes a significant difference in anxiety and fatigue so that such intervention contributes to reduced anxiety and fatigue. Therefore, such intervention can have positive effect on anxiety and fatigue symptoms and improve the quality of life.

LIMITATION

Significant results were obtained despite economic, environmental, human, and time constraints, the nature of MS, psychological condition, and more importantly, the fact that the effect of this technique was examined for the first time. It is suggested to study the effect of such exercise on other symptoms of MS patients and other chronic diseases.

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None declared.

CONFLICT OF INTEREST

None declared.

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