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Comparison of regular aerobic and yoga on the quality of life in patients with multiple sclerosis

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Abstract

Background: The pathophysiology of multiple sclerosis (MS) is characterized by fatigue, motor weakness, and spasticity, to name a few. MS symptoms may lead to physical inactivity associated with the development of secondary diseases. This study was to investigate the effect of regular aerobic and yoga on the quality of life of patients with MS.

Methods: The present quasi-experimental study was conducted on 90 patients with chronic MS chosen randomly and divided into two test and one control groups. Data were analyzed using SPSS software (version 11.5) through paired t-test, ANOVA, and Tukey's post hoc.

Results: There were no significant differences among the scores of quality of life in the three groups prior to investigation. Although they were significant after intervention. The mean score of yoga group was higher than that of aerobic group, and aerobic group showed a higher mean score compared with the control.

Conclusion: Yoga and aerobic exercises may improve quality of life in patients with MS. It is highly recommended that the governor along with MS societies and other organizations servicing and supporting patients start to develop sport-regulated programs to help improve quality of life for these patients.

Keywords: Multiple sclerosis (MS), Yoga, Aerobic exercises, Quality of life.

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Introduction

Multiple sclerosis (MS) is a chronic and devastating autoimmune demyelinating, neurodegenerative disorder of the central nervous system that has been present in society probably as early as the 14th century (1-3). MS affects women more than men (4). The disorder is most commonly diagnosed between ages 20 and 40 years old, but can be seen at any age (5). This disease manifests with a wide range of symptoms. Some MS patients have severe symptoms, including muscle weakness, extreme fatigue, imbalance, impaired speech, double vision, cognitive dysfunction, and paralysis leading to poor health related quality of life (HRQL). Related complications range from neurological disability, and high healthcare costs (approximately $1.7 billion annually in Canada, for example) (6,4), to mild weakness or numbness and balance abnormalities impacting walking mobility (7,8). These symptoms can be persistent or periodic and may also include loss of balance, loss of coordination, tremors, spasticity, pain, and bladder dysfunction (9,6). In most patients with MS the clinical onset is characterized by relapses and remissions. After a number of years the majority of these patients experience gradual progression of disability (secondary progressive MS). Another group of patients do not have relapses at the onset of MS, but steadily accumulate disability over time (primary progressive

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MS) (2).

The prevalence and incidence of MS are increasing globally over time and it has been predicted about one in 1000 people are affected with MS. There is an estimate of 2.5 million adults worldwide, probably leading to disability in 80% of cases. About one in five could have a stable condition with no relapsing (10,4). In recent years there has been a raising incidence of the disease in the world (11).

There is no official report denoting the number of MS patients in Iran. However, according to statistics provided by the Iranian Multiple Sclerosis Society, about 40000 people are affected (5). The mentioned consequences underscore the importance of developing physiologically relevant strategies for rehabilitation of function (6).

MS has a profound impact on the patients' social, psychological, and economical roles and their relatives' well-being. Severe disability and cognitive impairment are predictors of loss of employment. Decline in the standards of living and withdrawal from social and leisure activities among MS patients are strong indicators of stress among relatives (12).
Even though, drugs are used as a first medication of choice for MS patients, the non-pharmacologic ways (e.g. massage and exercise therapies) are also applied as supplementary treatments (13,11). This is due to their low costs and facilities (13). One of these exercises is yoga sport. Najafi Doulatabad et al. studied general health quality (GHQ) of life in patients with MS when using yoga and found that yoga was beneficial for MS patients' quality of life (11).

Exercise training has been proposed to counteract many of the consequences of MS (4). Indeed, the evidence indicates that engaging in exercise has the potential to improve and/or maintain functional ability, aerobic fitness, strength, fatigue, HRQL, depression, cognition, and chronic disease risk profiles among patients with MS (14-16). Unfortunately, despite the benefits of exercise training, most patients with MS are physically inactive. The studies directly comparing physical activity patterns among patients with MS, patients without MS, and patients with other chronic diseases indicate that patients with MS may be at the lowest end of the physical activity participation spectrum (4).

Furthermore, Pazokian et al. reported that aerobic exercises could improve quality of life in patients with MS by improving many of MS symptoms, including weakness, fatigue, and depression (5). Several studies have shown that quality of life is affected in patients with MS and these patients experience a variety of impairments and disabilities (1,17). With the passage of time and aggravation of symptoms, quality of life in patients with MS dramatically reduces (1). There has not been enough and reliable evidence to date supporting the benefits of exercise and yoga for improving HRQL outcomes. Also there is insufficient evidence to establish the prescriptive amounts, intensities, or types of exercise (regular aerobic or yoga) to improve these outcomes.

In view of the conducted studies less attention has been paid to physical activity such as yoga exercise and regular aerobic in MS patients. Therefore, this study was designed to compare regular aerobic and yoga effect on the quality of life of patients with MS.

Methods

This was a quasi-experimental study. Patients were randomized into control and experimental groups. For this study, 90 patients suffering from MS were chosen randomly and assigned into two test and one control groups. The ethical approval (with ethics code of 87-1-2) was obtained from Ethics Committee of Shahrekord University of Medical Sciences. The study registration code issued by Iranian Registry of Clinical Trials is IRCT2013063013768N2.

Inclusion criteria

Diagnosis of MS and consent to participate in the study were two inclusion crite-

ria. Other criteria for eligibility were ability to perform the exercise program after the medication therapy, having no difficulty with movement (such as rheumatoid arthritis, fractures, etc.), having no heart transplant three months after exercise program, having no advanced heart failure, and not traveling during the research.

Exclusion criteria

Deaths, surgery during the research, and unwillingness for cooperation were considered as exclusion criteria. Accordingly, in the experimental groups 20 (each 10) patients and in the control group 9 patients were excluded from the study.

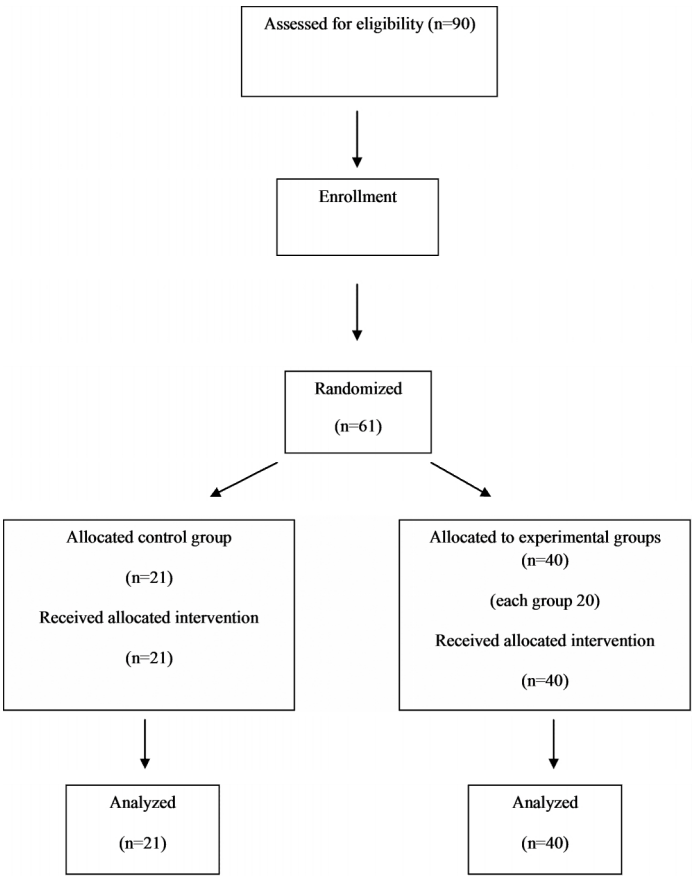
Procedure

The exercise program was performed three sessions a week for 12 weeks. The exercise program included 40 minutes, including 5-10 minutes for warm-up, 25-30 minutes of exercise (walking), and 5 minutes for cooling down (Total Body Workout).

Also yoga exercises were performed three sessions a week for 12 weeks. All of the exercise sessions were controlled by the nurse of research team at the hospital under the supervision of a neurologist. Blood pressure and heart rate were measured before and after exercise. The exercise program was performed in a particular location that had already been selected by the research team. No exercise training was applied for control group.

Drug treatment was not changed during the study in control and experimental groups. Because the disclosure of personal information could cause professional or personal problems, patients relied on physicians to keep their medical information private.

Patients assigned to the control group continued their individually tailored medications and were supervised by their nurse



and physician.

Instruments

The required data were collected by the Quality of Life Questionnaire (SF-36, second edition), and demographic questionnaire. The quality of life questionnaire was filled out for experimental groups and control group by the researchers twice, before the exercise program at the hospital and 12 weeks after the exercise program.

The content validity of the questionnaire was confirmed by 10 faculty members of Department of Nursing and Midwifery. For reliability assessment, the questionnaires were simultaneously completed and the correlation coefficient was calculated as 0.91.

Data analysis

The obtained data were analyzed using SPSS software (version 11.5) through paired t-test, ANOVA, and Tukey's post hoc. Also, $p< 0.05$ was considered as the level of significance. We used paired t-test to compare each group before and after intervention.

Results

All (61) patients were female except one. Mean age of the patients was 31.9 years. Table 1 shows the demographic characteristics of the groups. The mean score of quality of life, prior to study and after intervention, in yoga, aerobic, and control groups is shown in Table 2.

We found no significant difference among the scores of quality of life in the three groups prior to the investigation. However, significant differences were found among the scores of quality of life after the study. The mean score of the yoga group was higher than that of aerobic group and the mean score of the the aerobic group was higher than that of the control (Table 2). To compare mean difference in score of quality of life among the groups One-way ANOVA was used ($p<0.01$). The results of Tukey's post hoc showed that there was no significant difference between the yoga and aerobic groups, even though the mean score in the yoga was higher than that of the aer-

Table 1. The demographic characteristics of the groups

	Yoga		Aerobic		Control	
Marital status	No.	%	No.	%	No.	%
Single	2	10%	3	15%	4	19%
Married	18	90%	17	85%	17	81%
			Indersponsership			
Yes	17	85%	17	85%	16	76%
No	3	15%	3	15%	5	24%
			Level of education			
Primary	4	20%	5	20%	5	24%
Guidance	4	20%	5	25%	5	24%
High school	10	50%	7	35%	8	38%
Academy	2	10%	3	15%	3	14%
Employment	-					
House keeper	18	90%	18	90%	20	95%
Employed	2	10%	2	10%	1	5%
Insurance coverage	-					
Yes	20	100%	20	100%	20	100%
No	-				1	
Economic status						
Low	2	10%	4	20%	4	19%
Moderate	16	80%	14	70%	14	67%
Good	2	10%	2	10	3	14%
			No. of children			
0	5	25%	6	30%	6	28%
1	2	10%	1	5%	-	-
2	3	15%	3	15%	4	19%
3	4	20%	5	25%	3	14%
4	3	15%	5	25%	5	24%
5 and/or more than 5	3	15%	-	-	3	15%

Table 2. The mean score of quality of life, prior to study and after intervention, in yoga, aerobic, and control groups

Group	The score of quality of life prior to and after intervention		P value
Group 1 (Yoga)	Prior to intervention	1533± 759.10	
	After intervention	2446±540.76	0.05
Group 2 (Aerobic)	Prior to intervention	1240.24±527.32	0.05
	After intervention	2050±527.32	
Group 3 (Control)	Prior to intervention	1385.75±600.04	
	After intervention	1255.75±600.22	0.05

Table 3. The difference in mean score of quality of life between the groups

Group	Mean difference	Level of significance
Control- aerobic	877.10	0.000
Control-yoga	1106.41	0.000
Aerobic-yoga	229.32	0.07

obic group (Table 3). The results of statistical tests demonstrated that the score of the yoga group was significantly higher than that of the control group ($p<0.001$). The same took place between aerobic and control groups in a way that the score of aerobic group was significantly higher than that of the control ($p<0.001$). Paired t-test was used to compare mean difference of quality of life prior to and after the study. The results showed that the mean scores of quality of life among three groups of the patients significantly changed so that the scores of the yoga and aerobic groups increased but those of the control group decreased (Table 2).

Discussion

Several studies have shown that MS patients have a lower quality of life than other people. Similarly, the current study suggests that a programmed yoga sport can significantly improve the quality of life in MS patients (11). Studying GHQ of life in patients with MS performing yoga shows that yoga has health benefits for patients with MS and can improve their quality of life (18) which is consistent with results of the present study. The result of a study showed the effect of yoga exercise on cognitive performance, fatigue, morality and quality of life in MS patients (4). They found that yoga sport can lead to a significant enhancement in the recognition and quality of life (18).

The purpose of yoga is bring the body and mind together. The positive effects of yoga on enhancing quality of life in MS patients could be due to the effect of this sport on decreasing bodily and spiritual stresses, improving physical strength, and eliminating fatigue (19). There is consistent evidence that HRQL is compromised among persons with MS compared with the general population and patients with other chronic disease (20,21,10). This reduction in HRQL is associated with many aspects of MS, including diagnosis in the most productive years of one's life, unpredictable and unstable nature of the disease course, and the absence of a convincing disease-modifying therapy. Importantly, physical activity might be associated with improved HRQL in patients with MS through improving fatigue, depression, self-efficacy, social support, and disability status (4).

MS is a chronic disease and its rapid progression over time leads to physical, psychological, social, and economic disability in patients and reclusive and depressed patients may attempt divorce and even suicide. Thus, supplementary methods that are simple, economical, and practical can help patients back to the community and provide compatibility with the existing conditions. Another study showed that yoga had a positive effect on the skeletal system and also contributed to nervous, muscular, physical, and mental balance, with enhancement of mental, neurological, immunological, and cognitive adjustment, quality of life, and overall performance (22).

The present results also showed that regular exercise and aerobic exercise can improve the quality of life of patients with MS. The results of the study by Pazokian et

al. showed regular exercise was very beneficial for MS patients because regular exercise fixed muscle cramps, increased flexibility, and reduced fatigue in these patients (5). Based on findings from several studies with level 1 evidence and supporting research with level 4 evidence, 30-60 min of moderate aerobic training performed at least 2-3 times/week improves physical capacity. Besides, resistance training performed 2-3 times/week at a moderate intensity increases muscular strength (4,23). These findings are entirely consistent with our findings.

Oken et al. also reported that the exercise program promotes MS patients' tolerance and various dimensions of quality of life (18). Our results showed significant improvements in the exercise group after training ($p<0.05$). The present study demonstrated that supervised group exercise training was effective in improving balance, functional status, spasticity, fatigue, and quality of life in moderately affected patients with MS, with no exacerbation of their clinical status (24).

Walking exercise, the use of nutrition programs and relaxation techniques cause decrease in stress and promotion of performance. Therefore, the combination of three 20-min exercise sessions (each session in a separate day) in a week and healthy eating increases the body's resistance to stress (25).

Conclusion

The current study suggests that yoga and aerobic exercises improve quality of life in patients with MS. These kinds of sports are simple and with minimal damage and also can be performed in most places such as home and office. It is highly recommended that the governor along with MS societies and other organizations servicing and supporting patients start to develop sport-regulated programs for improving the quality of life in these patients.

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Conflict of interest

The authors of the present work declare no conflict of interest.

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