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Original Article

the effect of massage therapy on fatigue of patients with multiple sclerosis

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ABSTRACT

Background and purpose of the study: Nowadays, Multiple Sclerosis (MS) is considered as a common disease among the young population. It is associated with many complications, including fatigue. The research was conducted to evaluate the effect of massage therapy on fatigue in patients with multiple sclerosis referred to Samenolhojaj Center in Kerman. Methodology: This is a clinical trial (11IRCT201611217844N) conducted to evaluate 80 MS patients, assigned randomly into two groups of intervention and control. Patients in the intervention group received a massage therapy program and the control group received routine medical care. The instrument used in this research included a 4-section questionnaire (including demographic information, fatigue severity scale, fatigue reducing methods, and visual scale of the effectiveness of massage therapy). Data were analyzed using SPSS, version 21, software and descriptive statistics, independent and paired t-test, Pearson correlation and ANOVA. Results: The mean score of fatigue severity was 47.72 ± 10.25 before intervention in the control group and it was 48.30 ± 9.78 before intervention in the intervention group (P = 0.7). After the intervention, the mean of fatigue severity was 46.91 ± 7.07 in the control group and it was 43.89 ± 8.33 in the intervention group. This change was significant in the intervention group ($p < 0.05$). Conclusion: Massage therapy can be proposed as a non-medical, easy, and low-cost method for reducing fatigue in patients with multiple sclerosis. Further studies need to be conducted in this regard.

Keywords: Multiple Sclerosis, fatigue, massage therapy.

Introduction

Multiple sclerosis or MS is an autoimmune, chronic and progressive disease of central nervous system caused by demyelination inflammatory process in central nervous system [1, 2]. There are different reports on the prevalence of MS. It is estimated that more than 2 million people around the world are affected by MS [1]. The prevalence of MS varies in different Asian countries. Its prevalence is higher in West Asia and Central Asia compared to that in East Asia and South-East Asia [3]. There are no accurate statistics on the number of MS patients in Iran. Based on the report published by the 9th International Congress of MS in Iran in 2012, the prevalence it was about 60 per 100000 people [4]. The prevalence of MS was 31.5 per 100000 people in Kerman province and 57.3 per 100000 people in Kerman city. Its prevalence in females was three times more than that in males and the mean age for onset of this disease was 28.35 years [5].

One of the symptoms of this disease causes multiple psychosocial distresses which is called fatigue [6]. This symptom is found in 67-95% of patients with multiple sclerosis, and 50-60% of the patients consider it as the worst symptom of the MS and 4-15% of them consider it as the most disabling symptom of MS [7]. Moreover, the frequency of fatigue in 90% of patients with multiple sclerosis is more than 28 times per month [8]. As chronic diseases such as multiple sclerosis affects all economic, financial, social and emotional aspects of an

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individual, family and community and as the use of medication may have complications [9], using non-medical methods which can reduce fatigue in this group of patients seems to be rational. Complementary therapies can slow down or even inhibit the course of the disease, reduce the number of attacks, and delay its sudden onset [7]. In the mentioned studies, one-third of patients with multiple sclerosis use complementary therapies despite the availability of current and common treatments [10]. In a study conducted on the use of complementary and alternative therapies in MS patients, massage therapy has been one of the widely-used methods [11]. However, in a report published by the Committee for the development of guidelines for the use of alternative and complementary therapies for MS patients in 2014, it was stated that massage therapy is one of the treatments which no adequate evidence of its effectiveness and efficacy in MS patients has been provided [12]. As a result, this research was conducted to evaluate the effect of massage therapy on fatigue in patients with multiple sclerosis referred to Samenolhojaj Center for the treatment of certain diseases in Kerman.

Methodology

This research was a clinical trial (11IRCT201611217844N) conducted on the patients who met the inclusion and exclusion criteria of the study. Research inclusion criteria included 1- no history of using massage therapy, 2- reading and writing and speaking literacy, 3- lack of using fatigue reducing medicines, 4- fatigue severity score of 36 and above it, 5- being affected by the disease for more than 6 months, 6 - Not being in the acute phase of the disease 7 - Having first-degree members of the family for home massage 8-Non-pregnancy (pregnancy intention) in women 9- Lack of physical injury in the organs and spinal cord, 10-No history of recent seizure, asthma and allergy. The research exclusion criteria included: 1- being affected by other physical and mental diseases, 2-an increase in the severity of disease leading to hospitalization of the patient or the impossibility of performing the massage therapy program, 3. Unwillingness to cooperate, 4. Non-continuation of the massage program for any reason by patient or family (less than 10 sessions), 5- Being affected by acute diseases, infection, cold and pain during the study. 6- Having ulcer, redness and any lesions in the neck, spinal cord and organs during the study, which prevents the intervention. They were randomly assigned to control and case groups. Accordingly, the patients referred to the treatment centered on the odd days were included in the case group and those referred to the treatment center in even days were included in control group. The case group`s subjects underwent massage therapy and the control group did not receive any interventions. Before and after the intervention, a multi-section questionnaire was used to evaluate the results. The questionnaire consisted of four sections. Its first section examined individual characteristics and the disease.

The second section included the Fatigue Severity Scale, which consisted of 9 questions scored on the Likert scale (ranging from score 1 to score 7, in which score 1 means strongly disagree and score 7 means strongly agree). The range of scores was from 9 to 63. The higher score in this scale meant greater fatigue. The reliability of this instrument was examined in Iran using test-retest method (r = 0.83) [13]. The third section of the questionnaire was related to the fatigue reducing methods in five categories of energy conservation (reducing tasks, getting help from others, napping, sitting and continuing the activities, sleeping and stop working), increasing resistance against fatigue (performing simple activities such as housekeeping, exercising, walking, socializing with friends and family), distraction of thoughts (relaxation, worshiping, doing yoga exercises and a positive attitude to life), energy renewal (listening to music, periodic resting, reading and watching TV), temperature control (avoidance of heat, use of cool drinks and take a bath by lukewarm water) and other methods such as drinking, smoking, etc. The reliability of this questionnaire was examined through test-retest method (r = 0.84). The fourth section assessed the fatigue relief and the effectiveness of the fatigue reducing method. It included a 10-cm visual scale (number zero indicates ineffectiveness and the number 10 indicates the effectiveness of fatigue reduction method) [6]. Finally, the face validity and content validity of the whole questionnaire were examined and confirmed by 10 faculty members of the Razi Nursing Faculty.

A total of 13 techniques were used for massage therapy (four techniques for feet massage, three techniques for back, two techniques for neck and four techniques for hand). They were completely trained by physiotherapist at a one-hour session to one of the family members who had taken the responsibility of home massaging. Each patient in the intervention group received the massage therapy program three days per week for 4 weeks and 20 minutes per session. The massage time was planned with consent of the patient before bedtime. The minimum number of massage therapy sessions to enter the information in the data analysis stage included 10 sessions. Moreover, to remind the massage, an SMS was sent to patients, and a weekly massage table was provided to them for the control and follow up. Finally, the questionnaire was re-completed.

Sample size was calculated among 40 subjects in each of case and control groups with considering the type 1 error of 5% and bi-directional research hypothesis and insertion of the standard deviation of the fatigue score obtained in the research conducted by Bahreini et al in 2011 in the formula for pairwise comparison of means [7]. The ethical considerations of this research included voluntarily participating in the research and having freedom to withdraw from research at any time and the confidentiality of the information. Moreover, the massage program was provided to the control group`s subjects at the end of the study. It was conducted by obtaining the license of Ethics Committee of Kerman University of Medical Sciences under the code of 487/92/K. It was also registered in the Iranian Center for Registry of Clinical Trials under the code of 11 IRCT201611217844N.

Nominal variables were presented as absolute and relative frequency, and numerical variables were presented as a mean and standard deviation. Normal distribution in numerical variables was tested by Kolmogorov-Smirnov test and the parametric tests were used for inter-group comparison due to its non-significance. The number and percentage were used to present fatigue symptoms and the methods used to reduce it. To compare fatigue before and after intervention in two groups of control and comparison, independent t-test was used. To compare the fatigue severity before and after massage, paired t-test was used. To determine the relationship between fatigue severity and age and duration of the disease, Pearson correlation test was used. ANOVA and independent t-test were also used to compare numerical variables with nominal variables. Using the variables related to fatigue severity before massage, the regression model was formed using linear regression. The Enter method was utilized for model analysis. The significant level of 0.05> p was used in all statistical tests. Data were reported in number and percentage and through mean and standard deviation. The analysis was performed using SPSS, version 21, software.

Results

The data of 80 patients were analyzed in two groups of 40 patients and control group. Demographic data are presented in Table 1. There was no significant difference between the two groups. The mean score of fatigue severity before intervention was not significantly different between the two intervention and control groups. However, after the intervention, a reduction was seen in the mean of fatigue severity score in the control and intervention groups. This change was significant in the intervention group (p <0.05), but it was not significant in control group (Table 2). No significant difference was found between intervention and control groups in fatigue-associated problems of decreased appetite and intellectual disruption. The results of examining the fatigue relief visual scale before massage therapy in two intervention and control groups did not show any significant differences. However, after massage therapy, this difference was significant and the difference in the score of fatigue relief in the intervention group before and after massage therapy was significantly different (p <0.05) (Table 3).

Based on the regression model, these two variables predicted 11% of the variations in the rate of relief from fatigue. Women reported a score of 1.63 units less than men. Moreover, for each year of the disease, 0.12 units were added to this score. Therefore, it can be stated that the effect of the fatigue reducing method in women and patients who had a shorter duration of disease was lower in this study. Moreover, the only variable which affected the fatigue severity was the duration of the disease. It was examined using linear regression model and it was found that the variable in the model could predict 6% of variations in severity with FSS questionnaire. Hence, 0.43 units of fatigue severity decreased per each year of disease. Therefore, it can be stated that increasing the duration of the disease reduced the fatigue severity (Table 4).

Patients in the control group experienced fatigue problems such as decreased appetite (37.5%), intellectual disruption (27.5%), weight change (27.5%), bruising (22.5%) and sleep disruption (25%). They used hot water bathing (47.5%), exercising (42.5%), daily napping (37.5%), periodic resting (33.8%) and lying (31.3%) to reduce fatigue. Problems associated with fatigue in the intervention group included the loss of appetite (45%), intellectual disruption (35%), sleep disruption (30%), and weight change (27.5%). Fatigue reducing strategies in the intervention group included exercising (50%), hot water bathing (45%), worshiping, socializing with the family and daily napping (35%), avoidance of heat and lying (30%). There were no significant difference between the two groups in terms of problems associated with fatigue and the methods used to reduce fatigue (p <0.05).

Table 1: Demographic characteristics of the participants in the intervention and control groups

Variable		Intervention group	Control group	total	Result of statistical test
Age (year)		8.28±33.88	8.69±32.88	8.45±33.38	p=0.6
Disease duration (year)		6.10±7.73	5.79±5.55	6.01±6.64	p=0.1
Fatigue severity score before intervention		9.78±48.30	10.25±47.72	9.61±48.01	p=0.7
gender	male	(17.5%) 7	(32.5%) 13	(25%) 20	p= 0.1
	female	(82.5%) 33	(67.5%) 27	(75%) 60	
Marital status	single	(27.5%) 11	(45%) 18	(36.3%) 29	p= 0.1
	married	(72.5%) 29	(55%) 22	(63.8%) 51	
Job status	Self-employed	(15%) 6	(27.5%) 11	(21.3%) 17	p= 0.6
	employee	(12.5%) 5	(15%) 6	(13.8%) 11	
	housewife	(52.5%) 21	(45%) 18	(48.8%) 39	
	student	(10%) 4	(5%) 2	(7.5%) 6	
	unemployed	(10%) 4	(7.5%) 3	(8.8%) 7	
Education	illiterate	(2.5%) 1	(17.5%) 7	(10%) 8	p= 0.1
	Under diploma	(32.5%) 13	(22.5%) 9	(27.5%) 22	
	diploma	(32.5%) 13	(35%) 14	(33.8%) 27	
	Bachelor and higher	(32.5%) 13	(25%) 10	(28.8%) 23	

Table 2: Comparison of mean fatigue severity score in intervention and control groups before and after intervention

Variable	Before intervention	after intervention	Statistical test comparison result (paired t test)
fatigue severity in intervntion group	9.78±48.30	8.33±43.89	p=0.004
fatigue severity in control group	10.25±47.72	7.07±46.91	p=0.93

Table 3: Comparison of mean score of visual fatigue relief scale in two groups of intervention and control before and after massage therapy

Variable	Intervention group	Control group	Statistical test comparison result (independent t test)
Mean score before intervention	2.52±4.15	3.17±5.15	p=0.12
Mean score after intervention	2.33±6.85	3.07±5.55	p=0.03
Score difference before and after intervention	3.28±2.7	1.59±0.4	p=0.00
Result of comparison before and after (paired t)	p= 0.00	p=0.1	

Table 4: Relationship between demographic variables and fatigue severity and rate of fatigue relief among the research subjects of before intervention (in both groups)

Variable		Fatigue severity	Fatigue relief visual scale
Age		p=0.1, r=0.18	p=0.9, r=-0.11
Duration of disease		p=0.01, r=0.26	p=0.04, r=-0.22
gender	male	10.18±49.85	2.76±5.75
	female	9.89±47.4	2.86±4.28
	Independent t test	p=0.34	p=0.04
Marital status	single	10.65±49.41	2.81±4.72
	married	9.55±47.21	2.96±4.60
	Independent t test	p=0.34	p=0.86
Job status	Self-employed	11.27±46.76	3.23±4.05
	employee	8.40±46.18	2.94±6.09
	housewife	10.05±49.43	2.77±4.41
	student	7.28±43.33	2.42±5.33
	unemployed	10.70±50.00	2.93±4.57
	test ANOVA	p=0.56	p=0.4
Education	illiterate	12.29±48.75	3.13±6.12
	Under diploma	10.23±52.18	2.06±4.45
	diploma	8.88±47.74	2.97±4.44
	Bachelor and higher	9.00±44.08	3.39±4.56
	test ANOVA	p=0.05	p=0.5

Discussion and Conclusion

Multiple sclerosis causes many challenges in patients' life due to having disabling, chronic and unpredictable characteristics. Fatigue is one of the common symptoms of the disease, so that most patients complain of this symptom and describe it as one of the most common and worrying problems [14-16]. The results of this research revealed that the mean of fatigue severity in the intervention group before massage therapy was 48.3 with a standard deviation of 9.78. This result was in line with that of the research conducted by Bahreini et al [7], in which the mean fatigue was 49 with a standard deviation of 9.85 before the intervention.

The points mentioned above indicated the importance of the effect of fatigue on the lives of these patients and the need to use fatigue reducing methods, especially non-medical methods. In this research, massage therapy was used to reduce fatigue. It showed significant effect on the mean fatigue severity compared to the control group. The obtained results were in line with those of research conducted by Bahreini et al., 2011 on 36 women with MS. In this research, aromatherapy massage was used to reduce fatigue. It was finally revealed that the intervention group had a lower fatigue score than the control group and their difference was significant [7].

In order to reduce fatigue in patients with MS, other non-medical methods have also been used. In the study conducted by Ghaffari et al., in 2008, progressive muscle relaxation technique was used. In line with present study, they reported that implementation of this technique was effective in reducing the fatigue in patients with multiple sclerosis [13].

In a study conducted by Field et al., on people with chronic fatigue syndrome, massage therapy reduced the symptoms of fatigue and other somatic symptoms caused by chronic fatigue syndrome, which was consistent with the results of this study

[17]. Moreover, in a study conducted by Negahban et al., in 2013 to compare the effects of massage therapy and exercise therapy in MS patients, it was reported that massage therapy was more effective than exercise therapy in reducing the fatigue and muscle spasm and improving the balance of the patients [18]. In review of the litrature, no study was found on the ineffectiveness or inappropriate effect of non-medical fatigue reducing methods in MS patients.

Among the demographic variables studied in this research, none of them had an effect on fatigue severity, except for the duration of the disease which affected the mean of fatigue severity. Patients who had the disease for a longer period of time expressed less fatigue. This result might be attributed to the habituation of people to experience fatigue. This result was not in line with that of other studies such as Bahreini and Ghaffari [7, 13]. In addition, two variables of gender and duration of the disease affected the rate of relief from fatigue expressed by the patients. Thus, the effect of fatigue reducing methods was less before the intervention in shorter duration of the disease and in females. However, these variables did not affect the level of relief from fatigue after intervention. The mean age of the research subjects was 33.38 years, which was consistent with the results of research conducted by AtashzadehShurideh in which the mean of patients was 32.52 years [19] as well as other studies [6] and [7], in which the mean age of the patients was 31.5 and 34.71 years, respectively. It indicated that the incidence of this disease occured often in the age range of 20 to 40 years [20].

In this research, 51% of the subjects were married. The rate of married subjects in the research conducted by Atashzadeh Shurideh [19] and Bahreini [7] was 73.8% and 73%, respectively. In addition, 75% of the patients in this research were female. In line with this result, other studies have confirmed that females were affected by this disease twice more than males [20]. In the research conducted by Lerdal et al., the severity of fatigue in MS patients was lower in people with higher education level, but no significant difference was found in this study, and this inconsistency could be due to cultural differences in the population studied [21]. Given the prevalence of fatigue in patients with multiple sclerosis and its significant effects on the quality of life of these patients, conducting further studies to find more effective methods to reduce the fatigue of these patients seems to be essential. Accordingly, it is suggested that the use of non-medical methods, such as massage therapy, which might have physiological and even psychological effects on the patients and can be implemented easily and with low cost, to be considered, emphasized and investigated.

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