Original Article

Comparing the effects of reflexology and relaxation on fatigue in women with multiple sclerosis

Fatemeh Nazari[1], Mozhgan Soheili Shahreza[2], Vahid Shaygannejad[3], Mahboubeh Valiani[4]

Abstract

Background: Fatigue is the most common and highly disabling symptom of multiple sclerosis (MS) that has negative effects on employment, the process of socialization, compliance with the disease, and other factors effective on activities of daily living. The usage of complementary and alternative medicine methods in MS patients is higher than in the general population. However, there is no scientific evidence to support their effectiveness. Therefore, this study aimed to compare the effects of reflexology and relaxation on fatigue in women with MS.

Materials and Methods: This study is a single-blinded randomized clinical trial that was done on 75 patients with MS who referred to the MS Clinic of Ayatollah Kashani Hospital (Isfahan, Iran). After simple non-random sampling, participants were randomly assigned by minimization method to three groups: Reflexology, relaxation, and control groups (25 patients in each group). In the experimental groups, the interventions foot reflexology and relaxation (Jacobson and Benson) were performed for 4 weeks, twice a week for 40 min in each session, and the control group received care and routine medical treatment as directed by a physician. Data were collected through a questionnaire and the fatigue severity scale before, immediately after, and 2 months after interventions from all three groups. Data analysis was performed by SPSS version 18 using descriptive and inferential statistical methods.

Results: Findings obtained from analysis of variance (ANOVA) showed that there was no significant difference in the mean fatigue severity scores in the pre-interventions between the three groups ($P > 0.05$), but there was significant difference immediately after and 2 months after interventions between the three groups ($P < 0.05$). Findings obtained from repeated measures (ANOVA) showed that there was significant difference in the mean fatigue severity scores during different times between the three groups ($P < 0.05$), while this difference was not significant in the control group ($P > 0.05$). Furthermore, least significant difference *post-hoc* test revealed that the mean scores of fatigue severity immediately after intervention was lower in the reflexology group than in the other two groups and were lower in the relaxation group than in the control group; 2 months after interventions, the mean scores of fatigue severity were lower in the reflexology group than in the other two groups, but there was no significant difference between the two groups of relaxation and control ($P > 0.05$).

Conclusions: It seems that both interventions were effective in reducing fatigue, but the effects of reflexology on reducing fatigue were more than those of relaxation. Hence, as these two methods are effective and affordable techniques, they can be recommended.

Key words: Fatigue, multiple sclerosis, reflexology, relaxation

Introduction

Multiple sclerosis (MS) is a chronic disease of the central nervous system associated with axon degeneration in the brain and spinal cord.[1] The results of studies show that 85% of patients afflicted with the disease are 15–50 years old and that the highest level of MS incidence occurs between 20 and 40 years of age. The prevalence of this disease varies in different parts of the world, ranging from 5 cases per 100,000 individuals in the tropical regions to over 100–200 cases per 100,000 people in moderate regions.[2] In Iran, there are no exact statistics on the number of patients with MS, and a research performed in Isfahan city has estimated the prevalence of MS as 43.8 cases per 100,000 people.[3,4] MS has been

[1]Isfahan Neurosciences Research Center, Faculty Member, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran, [2]Department of Adult Health Nursing, School of Nursing and Midwifery, Alzahra Hospital, Isfahan, Iran, [3]Department of Neurology, School of Medicine, Research Center of Neurosciences, Isfahan University of Medical Sciences, Isfahan, Iran, [4]Department of Midwifery, School of Nursing and Midwifery, Isfahan University of Medical Sciences, Isfahan, Iran

Address for correspondence: Ms. Mozhgan Soheili Shahreza, Master Science of Medical Surgical Nursing, Alzahra Hospital, Isfahan, Iran.
E-mail: mozhgan.sohei@yahoo.com

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diagnosed to be prevalent 3 times more in women than in men.[5]

MS is a very complicated and multifaceted disease whose incidence is often associated with a variety of signs and symptoms.[6] MS signs and symptoms are indicative of the site of the lesion or a combination of lesions generated. Fatigue is the most highly disabling symptom of MS, often manifesting itself at the disease outbreak as the first sign and remaining in its weak or strong form throughout the disease course.[7] The exact mechanism of fatigue in MS has not been yet specified, but researchers believe that nervous, hormonal, and immune factors can be the agents of fatigue development,[8] and MS signs seem to worsen with fatigue. Over 90% of MS patients experience fatigue and 50–60% of them consider this problem as the worst sign of MS that severely influences patient's quality of life.[9] Notwithstanding the fact that fatigue is the primary or the secondary sign and due to MS complications, it can have adverse effects on vast dimensions including employment, the process of socialization, compliance with the disease, and other factors effective on activities of daily living. In fact, fatigue is the most important factor that causes decreased individual independence in MS patients and is reckoned among the most important causes of nonparticipation in physical activities and unemployment in these patients.[8,10]

Due to the mental and nonspecific nature and various manifestations of fatigue, its similarity to mental, motor, cognitive, and respiratory disorders, and lack of understanding of its exact etiology, the exact diagnosis and effective treatment of fatigue are difficult. On the other hand, fatigue can be partially controlled with drugs, though pharmacological therapies are associated with many complications and problems.[11] The social costs associated with MS are high because of its long duration, the early loss of productivity, the need for assistance in activities of daily living, and the use of immunotherapy.[12] Its annual general cost in USA has been estimated at $2.5 billion and in Iran at $41,000 on average for an MS p atient.[3,9] Also, due to the ever-increasing rate of affliction with MS, high mortality rate, high costs, and various problems of these patients, complications of medicinal therapies, and on the other hand, the economic and satisfactory results from complementary treatments, we witness increase in application of complementary medicine in the field care of such patients. Reflexology and relaxation are among the common and low-cost treatments in complementary medicine. Reflexology is a method for treatment in which massage and pressure are applied to regions in the hands, feet, and ears. It is based on the principle that reflexive points are in relation with internal organs and glands, designed in an arrangement complying with the physical body. By applying pressure onto these points, equilibrium can be returned back to the body system.[13] The relaxation technique involves anti-pressure, anti- muscle contraction, and is an instrument for increasing calmness in the body and eventually in the mind. During this treatment, the patient learns to alternatively contract and expand her body muscles, exactly identify the signs of tension in the body, and gradually obtain mental repose.[14] The physician of the alternative medicine office, Jonas Wayne, stresses the importance of nurses' role in performing and implementing complementary and alternative medicine along with the main course of medicine.[15] Wang believes that nurses are in a unique position to assess the client needs for these interventions, to evaluate the strength of evidence, and to adopt evidenced-based modalities.[16] The present research was conducted to compare the effects of reflexology and relaxation on fatigue severity in women with MS.

Materials and Methods

This is a single-blinded randomized clinical trial conducted in the form of a parallel three-group, three-phase, multivariate research before, immediately after, and 2 months after the intervention period plan in patients with MS referring to Ayatollah Kashani Hospital MS Clinic affiliated to Isfahan University of Medical Sciences in 2013. Using the formula for calculating sample size, the sample size for each group was found to be 30 patients (totally 90 patients), of which 15 patients were excluded from the research (2 patients due to leg fracture, 1 due to hospitalization for plasmapheresis, and 12 patients due to unwillingness to continue participation); thus, finally the research was conducted on 75 (25 in the reflexology group, 25 in the relaxation group, and 25 in the control group) patients.

The inclusion criteria were: Women aged 18–50 years; had types of MS (relapsing-remitting, primary progressive, and secondary progressive), diagnosed by neurologists based on Mc Donald's criteria with the elapse of at least 6 months from relevant diagnosis; had willingness to participate in the research; and had healthy feet without deformity, callus or corn, cleft, active thrombosis or phlebitis, varicose veins, recent ankle trauma, sprain, fracture, inflammation, or infection. Other inclusion criteria for the study participants were: No previous participation in treatment sessions such as reflexology, relaxation, or massage in the last 6 months; having fatigue severity score of equal to and over 4 based on fatigue severity scale (FSS) and having scores 0–5.5 based on the Expanded Disability Status Scale (EDSS); not being in the menstruation period; not afflicted with diseases other than MS, such as febrile acute or chronic mental or psychic disorders such as severe depression, speech or hearing disorder; not addicted to narcotics and psychotropic drugs; not being a member of the treatment crew (physician or nurse); and not being pregnant.

The excluded criteria were: Not willing to continue in the research; use of other types of complementary and alternative medicine methods; disability to participate in the sessions (over two consecutive absences in the reflexology and relaxation meetings); and disease recurrence within 1 month before the start of the interventions and/or during the intervention, which caused hospitalization.

After taking informed written consent, patients were included in one of the research groups (reflexology, relaxation, and control) by the minimization method using MiniPy software. The control group received only routine treatment and care recommended by the attending physician. For the experimental groups, the interventions of reflexology and relaxation were performed for 4 weeks, twice a week for 40 min in each session, in a bright, silent, warm room with suitable temperature and ventilation at Kashani MS Clinic. The intervention technique for the relaxation group was the combination of Jacobson and Benson applied upon full description on the intervention using the relaxation method with a CD which had been previously recorded and prepared, in which the research subjects were encouraged to perform the instructions. They should contract the muscles of each part of their body in an orderly manner for 5 s and then maintain them for 15 s in full relaxation state. Afterward, through mental conceptualization and application of all their senses, creative visualization, and concentration and respiration, relaxation was completed. Meanwhile, for consistency among samples, the patients were told not to use the technique alone at home until the end of the study. In the reflexology group, upon full description of the intervention, first of all, a general reflex therapy was performed by massaging all plantar reflexology points and then, a special reflex therapy was done. The major reflexive points in the feet were put under pressure using the thumb and index finger. Finally, the intervention was completed by the researcher with massage of the solar plexus.

In order to collect data, the questionnaire was filled out by the questioner before, immediately after, and 2 months after performance of the intervention, in the absence of the researcher. Meanwhile, the questioner was unaware of the type of intervention and, thus, was blinded to them. The questionnaire contains the items relevant to FSS, including 9 items with the scores of 1–7 for each item. A score of 1 indicates that the individual completely opposes that state and 7 indicates that the individual completely accepts it. The total score is obtained by dividing the sum of scores by 9 and is between 1 and 7, with 1 being no fatigue at all and 7 being the highest level of fatigue. The completion of this instrument takes less than 5 min and the patients should answer the items concerning the recent 2 weeks.[9] FSS instrument is one of the valid scales for fatigue measurement in patients with MS, designed in 1998 by Krupp. In a study, its Cronbach's alpha coefficient was obtained to be 0.96. The interclass correlation coefficient (ICC) test was also calculated and equaled 0.93 indicating the good repeatability of the Persian version of this questionnaire. Krupp *et al.* studied the validity and reliability of this scale in patients with MS. Its Cronbach's alpha was 0.81 and, therefore, the FSS has a high internal conformity.[17] Collected information was analyzed using statistical tests [Kruskal–Wallis, Chi-square, one-way analysis of variance (ANOVA), and repeated measures ANOVA] by SPSS software version 18 (SPSS Inc., 233 South Wacker Drive, 11th Floor, Chicago, IL 60606-6412).

Ethical considerations

The study was approved by research committee of Isfahan University of Medical Sciences. Also, the ethical permission of this study was obtained from ethics committee of this University.

Results

The findings of this study indicated there was no statistically significant difference between the three groups in terms of age, duration of affliction with MS, mean scores of fatigue severity, marital status, level of education, employment status, and the type of MS before intervention [Table 1]. Repeated measures ANOVA showed a statistically significant difference in the mean scores of fatigue severity in all three measurements of the reflexology and relaxation groups [before, immediately after, and 2 months after intervention ($P < 0.05$)]; however, it did not show a statistically significant difference in the control group ($P > 0.05$). One-way ANOVA showed that there was no statistically significant difference in the mean scores of fatigue severity between the three groups before intervention ($P > 0.05$). Yet, immediately after and 2 months after intervention, there was a significant difference in the mean scores of fatigue severity between the three groups ($P < 0.05$) [Table 2]. Also, the mean scores of fatigue severity were compared between two groups at a time, in which least significant difference *post-hoc* test was used. Results showed that the mean scores of fatigue severity

Table 1: Comparison of mean age and duration of multiple sclerosis in three groups

Variables	Mean (SD) (*n*=25)			*F*	*P*
	Reflexology	Relaxation	Control		
Age (years)	34.40 (6.60)	33.90 (5.60)	34.40 (7.70)	0.04	0.95
Duration of MS (years)	6.66 (5.47)	5.18 (4.69)	4.78 (3.36)	1.17	0.31

SD: Standard deviation, MS: Multiple sclerosis

Table 2: Comparison of the mean fatigue scores at different time periods (before, immediately after, and 2 months after interventions) in the three groups

Fatigue severity	Mean (SD) (*n*=25)			*F*	*P*
	Reflexology	Relaxation	Control		
Pre-test	4.98 (0.98)	4.93 (0.87)	4.89 (0.95)	0.05	0.95
Post-test	3.62 (1.06)	4.12 (0.83)	4.78 (1.01)	8.87	<0.001
Follow-up	3.89 (0.94)	4.37 (0.78)	4.74 (0.86)	6.09	0.004
F	33.53	23.94	0.49		
P value	<0.001	<0.001	0.62		

SD: Standard deviation

Table 3: Comparison of the mean fatigue scores between two groups at a time

Groups	*P*	
	Immediately after	2 months after
Reflexology and control	<0.001	<0.001
Reflexology and relaxation	0.04	0.03
Relaxation and control	0.01	0.13

immediately after intervention were lower in the reflexology group than in the other two groups and were lower in the relaxation group than in the control group; 2 months after intervention, the mean scores of fatigue severity were lower in the reflexology group than in the other two groups. Yet, the relaxation and control groups did not show a significant difference between them ($P > 0.05$) [Table 3].

Discussion

The findings from this research show that the techniques of reflexology and relaxation caused a decrease in fatigue severity in women with MS and that fatigue severity decreased in the two groups of reflexology and relaxation compared to the control group, whereas 2 months after the interventions, there was no difference in the mean scores of fatigue severity between the two groups of relaxation and control.

These findings reveal that the mean reduction in fatigue severity scores 2 months after the interventions were higher in the reflexology group compared to the relaxation group. The findings of Ghafari *et al*. showed relaxation to cause significant fatigue reduction in the experimental group compared to the control group at different time periods ($P < 0.01$).[9]

In a study conducted by Geongson *et al*. on the effects of reflexology on fatigue, sleep, and pain conducted in Korea, the results showed that reflexology as a nursing effective intervention relieves fatigue.[18] The results of a study by Salehi *et al*. showed that Benson's relaxation is effective on quality of life symptomatic scales (including fatigue severity) in breast cancer patients undergoing chemotherapy.[19] The results of a research by Pourghaznain *et al*. showed that foot reflexology causes decrease in fatigue severity in pregnant women.[20] Accordingly, Bahraini *et al*. compared the effects of two massage methods using aromatic and non-aromatic oils on fatigue severity in patients with MS and their findings showed that notwithstanding the type of oil, massage significantly influences fatigue severity in patients with MS.[21] In his research, Tavee (2011) investigated the effect of meditation, including walking relaxation, sitting relaxation, and moving relaxation, on the quality of life in patients with MS, and the results showed that there was a significant difference between the experimental and control groups in terms of fatigue severity in both cognitive and psychomotor components.[22] The results of the present research were in accordance with the results of similar researches conducted in relation to the effect of reflex ology and relaxation on fatigue severity.

Conclusion

It can thus be concluded that the techniques of reflexology and relaxation can be combined with therapeutic routine treatments and offered as useful and economic complements to take care of and relieve patients from the signs and symptoms of MS by MS health care providers, especially nurses, although the relaxation technique was less effective on fatigue severity compared with the reflexology technique. In relaxation, since the patient should play an active role and make active movements in all the steps, and reflexology is performed by the researcher, due to the effect of environmental and cultural factors of individuals on the level of their perception of the effect of the relaxation technique, the level of learning, and/or the existence of mental involvement, and due to not concentrating while learning the technique, a lower effect of the intervention on fatigue severity, compared with reflexology might have resulted. It is thus recommended to conduct other researches in this field using more time periods and more treatment sessions, and compare with other complementary medicine methods in all the patients with MS in both sexes.

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