

The effect of pelvic floor muscle exercises on sexual function in women with multiple sclerosis: a pre-/post-intervention clinical trial

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A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary Background. Sexual dysfunction (SD) is a common symptom in patients with multiple sclerosis (MS). In women with MS, there are no specific pharmacological or non-pharmacological therapies which have been proven effective for SD.

Objectives. The main objective of this study was to evaluate the effect of pelvic floor muscle exercises on improving sexual function in women with MS.

Material and methods. This study was a pre-/post-intervention clinical trial conducted on 45 MS women who had been referred to the MS Clinic in Ahvaz, Iran. All participants were selected by the purposeful sampling method. The data collection tools in this study included a demographic data form and the Female Sexual Function Index (FSFI) questionnaire. The study participants ($n = 45$) performed pelvic floor muscle exercises for 12 consecutive weeks. The data were analyzed as descriptive statistics (mean and standard deviation) with the Shapiro–Wilk test, the independent t -test, and the paired t -test using SPSS software version 24; a p -value of < 0.05 was selected as the significance level.

Results. The results revealed that after pelvic floor muscle exercise, the mean score of sexual function of women with MS had increased from 10.58 to 30.17 and that this increase was statistically significant ($p = 0.001$).

Conclusions. Pelvic floor muscle exercise can improve sexual function in women with MS. Thus, performing these exercises is recommended as an easy and cost-effective method to improve the sexual function of these patients.

Key words: sexuality, pelvic floor, multiple sclerosis, women.

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Background

Multiple sclerosis (MS) is the most common chronic nervous system disorder leading to disability and dysfunction in young people [1, 2]. It is most commonly seen in people between the ages of 20 and 45 years [1, 3]. The incidence of MS in women is three times higher than that in men [4, 5]. Reports have suggested that about 2.5 million people suffer from MS around the world [1].

This autoimmune disease is characterized by a variety of unpredictable signs and symptoms, such as muscle cramps, fatigue, pain, visual disturbances, dysphagia, speech and breathing disorders, bladder and intestinal problems, cognitive disorders, and sexual problems [6–9].

Sexual dysfunction (SD) is an important public health concern and a common symptom in MS patients, with a prevalence of 40% to 80% [9, 10]. Previous studies have suggested the incidence rate of SD to be 31% among Iranian females, but the prevalence of SD in Iranian women with MS is unknown [11].

Since MS occurs in ages at which patients are sexually active, it is important to find appropriate therapies to enhance their sexual function.

Pelvic floor muscles (PFMs) are known to play a key role in sexual function, as they are responsible for the involuntary rhythmic contractions during orgasm and for vaginal sensation during intercourse [12, 13].

One of the methods for strengthening the PFMs is a pelvic floor exercise that is also known as Kegel exercises [14, 15]. Kegel exercises involve repeated voluntary and selective contraction and relaxation of specific muscles in the pelvic floor [16–18]. It is argued that the use of PFM exercise might contribute to the involuntary contractions in women during intercourse and may increase the blood flow to the pelvic floor muscles, resulting in better sexual activity in couples [19]. In women with MS, there are no specific pharmacological or non-pharmacological therapies which have been proven effective in sexual dysfunction. Previous studies have shown the effects of PFM training in the treatment of SD in women suffering from MS [20].



Objectives

The aim of this study is to assess the efficiency of Kegel exercises as a safe and effective method for improving the sexual function in women suffering from multiple sclerosis.

Material and methods

Ethical consideration

This study was approved by the Ethics Committee of Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran in accordance with the Declaration of Helsinki (Ref No: IR.AJUMS.REC.1397.312). After explaining the aims of this research to all participants, their written informed consent was obtained.

Study design and data collection

This study was a pre-/post-intervention clinical trial conducted on MS women referred to the MS Clinic in Ahvaz, in southwestern Iran. The data were collected through a demographic data form and the Female Sexual Function Index (FSFI) questionnaire. The demographic data form included age, spouse's age, marriage duration, duration of disease, number of pregnancies, number of childbirths, type of delivery, educational level, job, spouse's educational level, spouse's job, economic situation, type of housing, type of disease, and the number of disease recurrences. The FSFI questionnaire was developed and validated in 2000 [21]. It contains 19 questions, including 2 questions concerning libido, 4 questions about sexual arousal, 4 questions regarding lubrication, and 3 questions each for orgasm, sexual satisfaction, and pain. A five-point Likert scale was used for scoring. The score of each domain was multiplied by a certain factor. The factor for desire was 0.6, for arousal and moisture was 0.3, and for other domains was 0.4. A total sum of each score is calculated, and higher scores indicate healthier sexual function. The scores range between 1.2 and 36 points [22]. In Iran, Mohammadi et al. calculated the reliability of the scale and subscales to be 0.85 through Cronbach's alpha coefficient for all individuals. In this study, the appropriate cut-off score of the whole scale for the diagnosis of sexual dysfunction was determined to be 28 points [23].

Participants and sampling method

In this study, 52 women with MS were selected by purposeful sampling. The sample size was determined using a 95% confidence interval, 80% power, and considering the probability of a 10% dropout rate in the PFM exercise group, according to the protocol of Machin et al. [24]. Accordingly, the sample size was determined using G Power package software version 3.1.

Inclusion and exclusion criteria

The inclusion criteria included an age range of 18–45 years, reading and writing literacy, being married, a diagnosis of multiple sclerosis, and a sexual function score below 26.5 on the FSFI questionnaire as administered by a neurologist. The exclusion criteria included severe cognitive problems, a disease recurrence in the previous three months, excessive fatigue preventing the person from performing the exercises, pelvic organ prolapse, and previous gynecological surgeries.

Intervention protocol

The study participants performed PFM exercises for 12 consecutive weeks. Kegel exercises were recommended to patients three times a day: morning, evening, and night. For each session, the subjects contracted their pelvic floor muscles five

times. They were also recommended to contract and relax their pelvic floor muscles 10 to 20 times immediately and without interruption after sexual intercourse, after completing urination, and between their daily activities. The PFM exercise group was followed up regularly by the researcher. Finally, the researcher re-administered the demographic and FSFI questionnaires after 12 weeks of the PFM exercise program. Any subject who had not regularly, daily exercised at home, or who experienced muscle weakness, blurred vision, or a lack of coordination, was excluded from the study.

Analysis of data

All statistical analyses were done using SPSS™ software version 24.0 (IBM Corporation, Armonk, NY, USA). An independent *t*-test was used to compare sexual function scores. A *p*-value of < 0.05 was considered to be the level of significance.

Results

In this study, out of 52 participants a total of 45 women with MS met the inclusion criteria. The mean age of the subjects was 35.71 ± 6.61 years. Tables 1 and 2 present the quantitative and qualitative demographic information of the study participants, respectively. Based on the results listed in Table 3, the total score of sexual function in the women with MS was 10.58 points before the intervention, which increased to 30.17 points after the intervention; this increase was statistically significant (*p* = 0.001). With regard to each dimension of sexual function, the results were as follows: the desire score increased from 2.04 to 4.72 points, the arousal score increased from 1.81 to 4.80 points, the vaginal moisture score increased from 1.73 to 5.08 points, the orgasm score increased from 1.60 to 5.16 points, the sexual satisfaction score increased from 1.93 to 5.92 points, and the pain score increased from 1.81 to 5.03 points after the intervention (*p* < 0.05).

Table 1. Comparison of the mean and standard deviation of the quantitative variables of the participants

Variable	Mean ± SD
Age (years)	35.71 ± 6.61
Spouse's age (years)	42.69 ± 8.86
Marriage duration (years)	14.07 ± 8.82
Number of pregnancies	2.18 ± 1.64
Number of childbirths	1.89 ± 1.31
Disease duration (years)	6.04 ± 3.33

Table 2. Frequency distribution and percentage of qualitative variables related to the participants

Variable	n (%)	
Type of delivery	caesarean	17 (37.8)
	natural with episiotomy	11 (24.4)
	natural childbirth	13 (28.9)
	no childbirth	4 (8.9)
Educational level	elementary school	14 (31.1)
	secondary school	6 (13.3)
	high school	8 (17.8)
	academic	17 (37.8)
Participant's job	employee	15 (33.3)
	housewife	30 (66.7)
Educational level of spouse	elementary school	2 (4.4)
	secondary school	9 (20)
	high school	13 (28.9)
	academic	21 (46.7)

Table 2. Frequency distribution and percentage of qualitative variables related to the participants

Variable		n (%)
Spouse's job	employee	19 (42.2)
	self-employed	20 (44.4)
	unemployed	6 (13.3)
Economic level	low	11 (24.4)
	average	28 (62.2)
	high	6 (13.3)
Type of housing	owner	27 (62.2)
	tenant	17 (37.8)
Type of disease	relapsing-remitting	29 (64.4)
	secondary-progressive	16 (35.6)
Number of disease recurrences	recurring	24 (53.3)
	one	15 (33.3)
	two	4 (8.9)
	more than two	2 (4.6)

Table 3. Comparison of FSFI domains and total scores before and after the intervention

MS women Variable	Before intervention (Mean ± SD)	After intervention (Mean ± SD)	p
Sexual desire	2.04 ± 0.78	4.72 ± 0.87	0.001
Sexual arousal	1.81 ± 0.87	4.8 ± 0.8	0.001
Vaginal moisture	1.73 ± 0.79	5.08 ± 0.65	0.001
Orgasm	1.6 ± 0.72	5.16 ± 0.54	0.001
Sexual satisfaction	1.93 ± 0.58	5.42 ± 0.54	0.001
Sexual pain	1.81 ± 0.88	5.03 ± 0.74	0.001
Total sexual function	10.58 ± 4.01	30.17 ± 3.4	0.001

Discussion

The results reveal that sexual function in women with MS was significantly improved after PFM exercise intervention. The sexual function score was 10.58 before the intervention, and it increased to 30.17 afterwards. The results of this study are consistent with the findings of Zohariou et al., which showed that PFM exercise improved the total score of sexual function from 20.3 ± 2.3 to 26.8 ± 2.8 in women with stress urinary incontinence after 12 months of intervention [16]. These effects seem to be due to the strengthening of the muscles attached to the clitoris, which can improve pelvic floor muscle involuntary con-

traction during orgasm by improving pelvic blood flow, pelvic mobility, and clitoral sensitivity. In fact, increased blood flow to the pelvis and increased clitoral sensitivity can improve sexual arousal, vaginal moisture, and orgasm [19].

Several reports from different countries have shown the efficacy of PFM exercises in improving sexual function in female patients, but so far few studies have examined the effect of these exercises on the sexual function of MS patients. In a study conducted by Citak et al., the results showed that PFM exercises did not increase sexual satisfaction, but they did have a positive effect on pelvic muscle function and female sexual function [25]. Thus, their results were consistent with those of the current study. In another study conducted by Pourkhiz et al., PFM exercises were able to improve female sexual function during pregnancy and delivery, findings that are in line with the current study [19]. In a study conducted by Zare et al., who evaluated the effect of PFM exercise on quality of life and marital satisfaction in primiparous women after delivery, the quality of sexual life in both the intervention and control groups had significantly improved eight weeks after the beginning of the study [26]. However, in contrast with the aforementioned studies, Lara et al. reported that PFM exercises were effective in strengthening these muscles, but they did not affect sexual function [27]. This discrepancy might be due to differences in the studied population, the sample size, sampling method, and measurement tools.

In one of the few studies conducted on MS patients, Lúcio et al. reported that PFM exercises alone or combination with electrostimulation have positive effects on the sexual function of women suffering from MS [20]. In their study, all evaluated groups showed an improvement overall and in the arousal, lubrication, and satisfaction domains of the FSFI questionnaire – this is in line with the current study.

Limitations of the study

In this study, the study group did not reach the specified number, due to some of the MS patients not qualifying for participation in the study.

Conclusions

PFM exercise is an effective method to increase sexual function in women with MS, and given its low cost and non-invasive nature, it is recommended to use Kegel exercises as a useful and effective method to improve sexual function in MS patients in general practice.

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