

The Effect of Physical Activity on Menopausal Symptoms in a Study Group of Postmenopausal Women

Postmenopozal Kadınlarda Fiziksel Aktivitenin Menopoz Semptomları Üzerine Etkisi

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ABSTRACT

The aim of this study was to examine the effect of physical activity on menopausal symptoms in postmenopausal women. A total of 268 women aged 40–65 years who had not menstruated for at least one year were included. Demographic data were recorded; physical activity levels were assessed using the International Physical Activity Questionnaire-Short Form (IPAQ-SF), and menopausal symptoms were evaluated with the Menopause Rating Scale (MRS). Of the participants, 16% (n=43) had high, 52% (n=140) moderate, and 32% (n=85) low physical activity levels. A weak negative correlation was found between the total MRS score and the total IPAQ-SF score ($r=-0.152$; $p=0.030$), as well as vigorous physical activity ($r=-0.150$; $p=0.029$). Additionally, the urogenital subscale of the MRS was negatively correlated with both the total IPAQ-SF score ($r=-0.184$; $p=0.009$) and vigorous physical activity ($r=-0.155$; $p=0.024$). In conclusion, higher physical activity levels were associated with reduced menopausal symptoms and urogenital complaints, but not somatic or psychological symptoms.

Keywords: postmenopausal women; physical activity; menopausal symptoms; International Physical Activity Questionnaire; Menopause Rating Scale

ÖZ

Çalışmanın amacı, postmenopozal kadınlarda fiziksel aktivitenin menopoz semptomları üzerine etkisini incelemektir. Araştırmaya, 40-65 yaş aralığında, en az bir yıldır menstrüasyonu olmayan 268 kadın dahil edildi. Katılımcıların demografik bilgileri kaydedildi; fiziksel aktivite düzeyleri Uluslararası Fiziksel Aktivite Anketi-Kısa Form (UFAA-KF), menopoz yakınmaları ise Menopoz Semptomları Değerlendirme Ölçeği (MSDÖ) ile değerlendirildi. Katılımcıların %16'sı (n=43) yüksek, %52'si (n=140) orta ve %32'si (n=85) düşük aktivite seviyesine sahipti. MSDÖ toplam puanı ile UFAA-KF toplam puanı arasında negatif yönlü zayıf korelasyon ($r=-0,152$; $p=0,030$) ve şiddetli fiziksel aktivite alt boyutu ile ilişki ($r=-0,150$; $p=0,029$) saptandı. MSDÖ'nin ürogenital şikayetler alt boyutu ile UFAA-KF toplam puanı ($r=-0,184$; $p=0,009$) ve şiddetli fiziksel aktivite ($r=-0,155$; $p=0,024$) arasında da negatif yönlü zayıf korelasyon vardı. Sonuç olarak, fiziksel aktivite düzeyi yükseldikçe menopoz semptomlarının ve ürogenital şikayetlerin azaldığı, ancak somatik ve psikolojik semptomlar üzerinde etkisinin olmadığı görülmüştür.

Anahtar Kelimeler: postmenopozal kadınlar; fiziksel aktivite; menopoz semptomları; Uluslararası Fiziksel Aktivite Anketi; Menopoz Semptomları Değerlendirme Ölçeği

INTRODUCTION

Menopause is defined as the permanent cessation of menstruation and is generally categorized into premenopausal, perimenopausal, and postmenopausal stages according to endocrine status and menstrual regularity (1). With the cessation of ovarian function, estrogen levels decrease, and this endocrine change may lead to various symptoms such as hot flashes, night sweats,

sleep disturbances, decreased libido, weight gain, depression, and general fatigue (2,3-5). Endocrine alterations and vasomotor symptoms such as hot flashes place women at high risk of psychological symptoms and negatively affect their quality of life (1). Although hormone replacement therapy is frequently used to reduce menopausal symptoms, particularly vasomotor symptoms, this option is associated with various complications. Therefore, non-pharmacological approaches such as lifestyle modifications and physical activity have attracted increasing attention (3,6,7).

The positive effects of physical activity on overall health are indisputable (8,9). In addition to treatment options to relieve menopausal symptoms in women, physical activity and exercise are also recommended to cope with them. Meta-analyses

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support the positive effects of physical activity on health in various populations (8,9,10). Whereas the benefits of physical activity are well known, a decline in physical performance is observed in perimenopausal women during the transition to the postmenopausal period (11). Similarly, there is a decrease in daily living activities in women in the menopausal period (12). In the sociocultural context of Türkiye, factors including women's role in the family and society and their educational level appear to predispose them to physical inactivity (2). Regular physical activity and exercise have an important role in stabilizing normal blood circulation and physiological changes in postmenopausal women, increasing endorphin hormone secretion, and triggering a state of happiness (7). Studies have reported positive effects of regular physical activity on vasomotor symptoms (2,13-16). A review study reporting the effect of physical activity and exercise on hot flashes concluded that regular moderate-intensity physical activity can reduce hot flashes (15). On the other hand, there is also a study reporting that six months of moderate activity has no effect on vasomotor symptoms (17). The current literature presents conflicting findings regarding the effect of physical activity, particularly on vasomotor symptoms of menopause.

The prevalence of menopausal symptoms may also vary according to women's lifestyle, genetic characteristics, and geographical, ethnic, and sociocultural differences (4,5,14,18). Findings from a study conducted in Lebanon demonstrated that exercise was effective in alleviating menopausal symptoms (5). In a study of middle-aged women in China, physical activity level was identified as the most important factor influencing the severity of menopausal symptoms (16). Yılmaz et al. (19) investigated the effects of physical activity habits and the presence of depression on menopausal symptoms in postmenopausal women in Türkiye, reporting that depression may lead to more severe menopausal symptoms, whereas regular physical activity may play a significant role in improving them. Similarly, Tan et al. (14) showed that somatovegetative, psychological, and urogenital symptoms could be

alleviated through physical activity. Investigating the relationship between physical activity and the severity of menopausal symptoms may provide guidance for interventions and help women cope more comfortably with this period. The aim of our study was to investigate the effect of physical activity on menopausal symptoms in postmenopausal women.

MATERIALS AND METHODS

Study Design and Participants

This study, designed as prospective and descriptive, was conducted between January 1 and June 30, 2022. The population of the study consisted of postmenopausal women registered in a family health center affiliated to Kayseri Provincial Health Directorate. A total of 268 literate women, aged between 40 and 65 years and amenorrheic for at least one year, were included in the study except women receiving psychiatric treatment. When the literature was examined, a significant negative correlation with a correlation coefficient of 0.205 was reported between the level of physical activity assessed by the International Physical Activity Questionnaire and menopausal symptoms in menopausal women (19). In our study, it was predicted that a similar relationship with a correlation coefficient of at least 0.200 would be detected between physical activity and menopausal symptoms, and it was calculated that at least 258 women should be included in the study in order to determine this relationship with a 95% confidence level and 90% power (20). To prevent potential loss of data, 268 women were included in the study.

Ethics committee approval (No: 2021/4624) was received from the XXXX dated October 27, 2021. The study was conducted in accordance with the principles of the Declaration of Helsinki. Institutional permission was obtained from the XXX Provincial Health Directorate (E-93079172-703.01). Both verbal and written informed consent for participation in the study were obtained from the women participating in the study.

Assessments

Data from the women included in the study were collected using the Personal Information Form, the International Physical Activity Questionnaire–Short Form (IPAQ-SF), and the Menopause Rating Scale (MRS). The data collection tools were administered through face-to-face interviews.

Descriptive form: To assess the women's sociodemographic and obstetric characteristics, a study-specific Personal Information Form was developed. This form included 11 items—six open-ended and five closed-ended—covering age, marital status, educational level, employment status, smoking status, type of menopause, number of pregnancies and deliveries, age at menopause, weight, and height.

International Physical Activity Questionnaire - Short Form (IPAQ-SF): The physical activity level of the women was assessed using the IPAQ-SF. The IPAQ-SF is a self-reported questionnaire consisting of questions on the frequency and duration of physical activity performed for at least 10 minutes over the past seven days (21). The Turkish validity and reliability study was conducted by Sağlam et al. (22). For the items assessing vigorous activity, moderate activity, and walking, the reported duration of activity is multiplied by the corresponding Metabolic Equivalent of Task (MET), and the total physical activity score is calculated by summing the results of all items. Higher scores reflect better physical activity levels (21,22). In our study, physical activity levels were classified according to the total IPAQ-SF score as high (>3000 MET-min/week), moderate ($600\text{--}3000$ MET-min/week), and low (<600 MET-min/week).

Menopausal Symptoms Rating Scale (MSRS): The Menopause Rating Scale (MRS) was used to assess the severity of menopausal symptoms. The scale includes 11 climacteric symptoms such as hot flashes, sweating, cardiac problems, sleep disturbances, depressive mood, irritability, anxiety, physical and mental exhaustion, sexual problems, bladder problems, vaginal dryness, and joint and muscular discomfort. Each symptom is rated on a scale from 0 (no symptoms) to 4 (very severe). The scale consists of three subdimensions:

somatic complaints, psychological complaints, and urogenital complaints. The total MRS score ranges from 0 to 44, with higher scores indicating more severe menopausal symptoms (23). The Turkish validity and reliability study was conducted by Can-Gürkan et al. (24).

Statistical Analysis

The data obtained were evaluated by creating a database in the SPSS 28.0 software program. Descriptive statistical methods such as frequency, percentage, mean, standard deviation, minimum, and maximum values were used to assess the sociodemographic data. The normality of the data distribution was examined using the Kolmogorov–Smirnov test. For data meeting parametric assumptions, the independent samples t-test was applied for comparisons between two groups, while ANOVA was used for comparisons among more than two groups. Post-hoc analyses were performed using Tukey's test when the homogeneity assumption was met and Tamhane's T2 test when it was not. For data not meeting parametric assumptions, the Mann–Whitney U test was applied for two-group comparisons, and the Kruskal–Wallis test was used for comparisons among more than two groups. Pearson's correlation coefficient was used for correlation analyses. Results were evaluated at a 95% confidence interval with a significance level of $p<0.05$.

RESULTS

The mean age of the women participating in the study was 51.94 ± 4.27 years, and the mean age at menopause was 49.11 ± 3.48 years. The mean number of pregnancies was 3.0 ± 1.20 , while the mean number of deliveries was calculated as 2.64 ± 1.14 . The mean body mass index was 27.11 ± 3.69 kg/m². Other demographic characteristics of the women included in the study are presented in Table 1.

Table 1. Sociodemographic characteristics (n = 268), Kayseri, 2022		
	n	%
Age		
41-46	15	5.6
47-52	144	53.7
53-58	88	32.8
59-64	21	7.8
Marital status		
Married	230	85.2
Single	38	14.2
Education		
	13	4.9
Literate	47	17.5
Primary school	67	25.0
Secondary school	103	38.4
High school	38	14.2
University		
Employment		
Working	124	46.3
Not working	144	53.7
Smoking		
Smoker	92	86.2
Non-smoker	176	65.7
Type of menopause		
	231	86.2
Natural	37	13.8
Surgical		

Table 2. Physical activity levels and severity of menopausal symptoms in women, Kayseri, 2022	
	X ± SS
MRS Scores	
Somatic	7.01 ± 2.84
Psychological	7.20 ± 3.05
Urogenital	4.41 ± 2.39
Total	18.63 ± 6.67
IPAQ-SF Scores	
Vigorous	1188.47 ±
Moderate	1195.97
Walking	507.64 ± 540.07
Total	532.60 ± 583.53
	2163.09 ±
	1792.25
	n (%)
Levels of Physical Activity	
High	43 (16)
Moderate	140 (52)
Low	85 (32)
X ± SD = mean ± standard deviation; MRS = Menopause Rating Scale; IPAQ-SF = International Physical Activity Questionnaire – Short Form	

Table 2 presents the IPAQ-SF scores reflecting the physical activity levels of the women, along with the total and subscale scores of the MRS indicating menopausal complaints. The correlations between women's physical activity levels and menopausal symptoms are shown in Table 3. Accordingly, a weak negative correlation was found between the total MRS score and both the total IPAQ-SF score ($r = -0.152$; $p = 0.030$) and the vigorous physical activity subscale score ($r = -0.150$; $p = 0.029$). In addition, a weak negative correlation was observed between the urogenital subscale score of the MRS and both the total IPAQ-SF score ($r = -0.184$; $p = 0.009$) and the vigorous physical activity score ($r = -0.155$; $p = 0.024$).

Table 3. The correlation between physical activity and menopausal symptoms, Kayseri, 2022

		1	2	3	4	5	6	7	8
1	High physical activity	-	0.511**	0.389**	-0.150*	-0.078	-0.115	-0.155*	0.871**
2	Moderate physical activity		-	0.539**	-0.111	-0.021	-0.106	-0.126	0.749**
3	Walking			-	0.049	0.152	-0.005	0.002	0.681**
4	Total IPAQ-SF				-	-0.048	-0.115	-0.184*	-0.152*
5	Somatic					-	0.560**	0.409**	0.837**
6	Psychological						-	0.376**	0.828**
7	Urogenital							-	0.686**
8	Total MRS								-

MRS = Menopause Rating Scale; IPAQ-SF = International Physical Activity Questionnaire – Short Form
 * $p < 0,05$; ** $p < 0,01$

Table 4 presents the comparison of women's demographic characteristics with their physical activity levels and menopausal symptoms. Significant differences were found between women's age groups and both IPAQ-SF and MRS total scores ($p < 0.05$). Accordingly, women aged 47–52 years had higher IPAQ-SF total scores compared with other age groups ($KW = 15.966$; $p < 0.001$), whereas women aged 53–58 years had higher menopausal symptom scores than the other groups ($F = 7.260$; $p < 0.001$). Regarding marital status, married women reported higher

menopausal symptom scores compared with single women ($t = 2.411$; $p = 0.017$). While higher educational level was associated with increased physical activity ($KW = 11.504$; $p = 0.021$), no statistically significant difference was found between educational level and menopausal symptoms ($F = 2.185$; $p = 0.071$). Working women reported lower menopausal symptom scores ($t = -3.320$; $p = 0.001$) and higher moderate physical activity levels ($z = -2.111$; $p = 0.035$) compared with non-working women. Furthermore, women who smoked had higher activity levels than non-smokers ($z = -2.139$; $p = 0.032$).

	High PA	Moderate PA	Walking	Total IPAQ-SF	Somatic	Psychological	Urogenital	Total MRS
Age								
41-46 ^a	99.39	141.11	111.07	107.82	5.46±2.53	7.20±2.27	3.53±1.68	16.20±4.82
47-52 ^b	120.34	124.41	144.46	114.26	6.38±2.67	6.60±2.90	4.23±2.28	17.22±6.28
53-58 ^c	86.08	102.36	130.15	81.20	8.14±2.71	7.94±3.12	4.82±2.65	20.92±6.70
59-64 ^d	63.03	74.44	89.48	71.16	7.71±3.08	8.28±3.50	4.47±2.22	20.47±7.44
	KW: 21.171 p<0.001* b>c,d	KW: 13.688 p: 0.003* a,b>c,d	KW: 11.249 p: 0.010* b,c>d	KW: 15.966 p: 0.001* b>c,d	F: 9.831 p<0.001* c>a,b	F: 4.614 p: 0.004* c>b	F: 1.849 p: 0.139	F: 7.260 p<0.001* c>a,b
Marital status								
Married	104.98	113.41	136.06	102.52	7.13±2.84	7.21±3.00	4.67±2.32	19.03±6.62
Single	111.92	127.13	118.12	102.37	6.26±2.75	7.18±3.41	2.78±2.15	16.23±6.56
	z: -0.590 p: 0.555	z: -1.131 p: 0.258	z: -1.334 p: 0.182	z: -0.013 p: 0.989	t: 1.767 p: 0.078	t: 0.054 p: 0.957	t: 4.681 p: 0.000*	t: 2.411 p: 0.017*
Education								
Literate ^a	40.93	52.75	95.58	38.33	9.33±3.49	8.41±4.03	5.41±3.57	23.16±9.47
Primary school ^b	103.50	104.46	129.32	99.30	7.57±2.91	7.85±2.83	4.40±2.10	19.82±6.47
Secondary school ^c	93.43	110.40	138.07	90.20	6.91±2.89	6.91±2.90	4.32±2.64	18.14±7.00
High school ^d	115.39	124.23	138.91	110.60	6.71±2.51	7.07±3.20	4.45±2.31	18.25±6.28
University ^e	113.79	125.50	128.35	111.46	6.58±2.97	6.92±2.79	4.12±2.05	17.64±5.92
	KW: 12.878 p: 0.012* b,c,d>a d>c	KW: 11.144 p: 0.025* b,c,d>a	KW: 3.982 p: 0.408	KW: 11.504 p: 0.021* b,c,d>a d>c	F: 3.063 p: 0.017* a<c,d,e	F: 1.283 p: 0.277	F: 0.692 p: 0.598	F: 2.185 p: 0.071
Employment								
Working	109.85	125.10	126.20	105.03	6.26±2.65	6.86±3.13	4.07±2.42	17.20±6.78
Not working	102.39	106.70	139.88	100.07	7.75±2.84	7.50±2.97	4.70±2.33	19.86±6.34
	z: -0.895 p: 0.71	z: -2.111 p: 0.035*	z: -1.450 p: 0.147	z: -0.600 p: 0.548	t: -4.119 p: 0.000*	t: -1.725 p: 0.086	t: -2.160 p: 0.032*	t: -3.320 p: 0.001*
Smoking								
Smoker	120.60	125.90	147.07	115.43	6.89±2.65	6.88±3.09	4.36±2.31	18.14±6.35
Non-smoker	99.20	110.37	126.32	96.45	7.07±2.94	7.38±3.03	4.43±2.43	18.89±6.84
	z: -2.392 p: 0.017*	z: -1.678 p: 0.093	z: -2.097 p: 0.036*	z: -2.139 p: 0.032*	t: -0.514 p: 0.608	t: -1.273 p: 0.204	t: -0.202 p: 0.840	t: -0.874 p: 0.383
Type of menopause								
Natural	107.89	115.76	132.81	103.70	6.98±2.92	7.17±3.06	4.39±2.40	18.56±6.86
Surgical	92.58	113.64	137.92	93.02	7.18±2.30	7.40±3.05	4.48±2.31	19.08±5.42
	z: -1.208 p: 0.227	z: -0.159 p: 0.874	z: -0.371 p: 0.710	z: -0.817 p: 0.414	t: -0.401 p: 0.689	t: -0.420 p: 0.675	t: -0.208 p: 0.836	t: -0.438 p: 0.662
PA = physical activity; MRS = Menopause Rating Scale; IPAQ-SF = International Physical Activity Questionnaire – Short Form								

DISCUSSION

In this study, which examined the effects of physical activity on menopausal complaints in postmenopausal women, it was found that higher levels of physical activity were associated with reduced menopausal symptoms, particularly urogenital complaints. Moreover, women who were employed had higher moderate-intensity physical activity scores and reported less severe menopausal symptoms compared with unemployed women. However, no significant effect of physical activity was observed on somatic and psychological menopausal complaints.

The frequency and severity of somatic, vasomotor, and psychological symptoms associated with menopause may vary depending on sociocultural, ethnic, genetic, and environmental factors (4,5,14,18). Physical activity is considered a relatively inexpensive and feasible approach for managing various symptoms such as hot flashes, night sweats, sleep disturbances, reduced libido, weight gain, depression, and general fatigue (2,3,5,15). Wu et al. (16) reported that physical activity level was the most important factor influencing the severity of menopausal symptoms in middle-aged women in Northwest China. Similarly, a study conducted in Lebanon demonstrated that physically active women reported fewer vasomotor, psychosocial, physical, and sexual symptoms compared with sedentary women (5). Research among Polish women also revealed an association between physical activity and menopausal symptoms, showing that women with high and moderate physical activity levels experienced milder symptoms compared with inactive women (25). Hot flashes, typically characterized as a sudden-onset condition involving sensations of heat, sweating, and increased heart rate, are among the most common symptoms experienced during menopause and may persist for up to 10 years after menopause (26). Witkowski et al. (15) reported that regular moderate-intensity physical activity may help alleviate hot flashes. Likewise, Tan et al. (14) found that somatovegetative, psychological, and urogenital symptoms in perimenopausal and postmenopausal women could be mitigated by physical activity. Conversely, a Cochrane

review concluded that there was insufficient evidence to determine whether physical activity is an effective treatment for vasomotor symptoms such as hot flashes and night sweats (27). In our study, although the total menopausal symptom score was negatively associated with physical activity, no significant relationship was found with vasomotor symptoms. We suggest that the mechanisms underlying the effects of physical activity and exercise on vasomotor symptoms are not yet fully understood, and further high-quality studies are needed to clarify these inconsistencies.

While the effectiveness of physical activity as a treatment option for hot flashes and night sweats remains uncertain, it is well established that physical activity provides numerous benefits for both physical and psychological health (3,8,9,10). In addition to neurogenic mechanisms such as increased dopamine and endorphin levels, social mechanisms such as enhanced self-efficacy associated with participation in physical activity play a key role in improving psychological health (5,28). Women who are physically active experience less stress during and after menopause and generally report better overall quality of life (29). Moderate levels of physical activity have been associated with lower depressive symptoms and higher positive affect in postmenopausal women, suggesting that physical activity may mitigate the potential adverse effects of menopause on mental well-being (30). In a study conducted in Türkiye, Yılmaz et al. (2) reported that the presence of depression in postmenopausal women may lead to more severe menopausal symptoms, while physical activity habits may play a protective role. Similarly, Tan et al. (14) demonstrated that physical activity could positively influence psychological symptoms of menopause. However, in our study, no significant association was found between physical activity and psychological symptoms in postmenopausal women. When examining studies conducted in Türkiye, Tan et al. (14) reported that 57% of participants had low levels of physical activity, whereas Yılmaz et al. (2) found that 52% of women had high levels of activity. In our study, more than half of the participants (52%) had

moderate levels of physical activity, and 16% had high levels. These variations in physical activity levels may have contributed to the differing impacts on psychological symptoms. Moreover, differences in the severity of symptoms may be influenced by sociocultural and ethnic factors, as well as by the support women receive from their spouses and families in coping with these changes (5), which may explain the discrepancy between our results and those of previous studies.

In our study, a negative association was also found between physical activity and not only the total score of menopausal symptoms but also urogenital symptoms. Consistent with previous studies, physical activity has been shown to alleviate urogenital symptoms (2,14). The female genital tract (vagina, vulva, urethra, etc.) contains estrogen receptors, and the decline in estrogen levels during menopause can lead to atrophy, vaginal dryness, frequent urination, recurrent urinary tract infections, and/or urinary incontinence (4). Physical activity may reduce urogenital symptoms and improve women's sexual health by enhancing circulation, which provides better vascularization and peripheral oxygenation (5).

It has been reported that middle-aged women with low physical activity levels in the workplace suffer from more severe somatovegetative symptoms (25). In our study, menopausal symptoms were found to be lower among employed women compared with unemployed women. Although there was no statistically significant difference in total physical activity scores, the higher moderate-intensity activity scores observed in employed women may have had a positive effect on their menopausal symptoms. Physical activity includes not only organized exercises during leisure time but also daily activities throughout the day; however, little is known about household and workplace activities (25). Commuting to work and performing daily activities at the workplace may have contributed to fewer menopausal symptoms among employed women. Interestingly, in our study, women who smoked had higher physical

activity levels than non-smokers. This may be explained by women attempting to compensate for the harmful effects of smoking by increasing their physical activity levels to protect their health.

Socioeconomic status may also influence menopausal symptoms, and the lack of assessment of socioeconomic status represents a limitation of the present study. Likewise, different types of physical activity and exercise may have varying effects on symptoms, and the absence of an evaluation of activity types constitutes another limitation.

Our study demonstrated that, among women aged 40–65 years, higher levels of physical activity were associated with less severe menopausal symptoms. In particular, high levels of physical activity may have beneficial effects on postmenopausal urogenital symptoms. Interventions aimed at increasing physical activity levels and promoting an active lifestyle during the postmenopausal period may help reduce the severity of menopausal symptoms experienced by women.

Conflict of Interest

The authors declare that there is no conflict of interest with any individual or institution within the scope of this study.

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