THE PLANET

Original Article

Severity of Postmenopausal Syndrome and Its Association with Physical Activity

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ARTICLE INFO

Received: 4 Apr 2026
Accepted: 10 Apr 2026
Published Online:

DOI: 10.5281/zenodo.19486032

Volume: 9, Number: 2, Page: 101-106

e-ISSN: 2789-5912
ISSN: 2617-0817

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ABSTRACT

Background: Menopause is a natural physiological transition characterized by cessation of ovarian function and a decline in estrogen levels, often accompanied by multiple somatic, psychological, and urogenital symptoms collectively referred to as postmenopausal syndrome. Lifestyle factors, particularly physical activity, may influence the severity of these symptoms and overall quality of life. Aim of the study: To assess the severity of postmenopausal syndrome and examine its association with physical activity among postmenopausal women. **Methods & Materials**: A cross-sectional analytical study was conducted among 200 postmenopausal women aged 45–65 years in Bangladesh. Participants were selected based on defined inclusion and exclusion criteria. Data were collected through face-to-face interviews using a structured questionnaire. The severity of menopausal symptoms was evaluated using the Menopause Rating Scale (MRS), while physical activity levels were assessed using the International Physical Activity Questionnaire–Short Form (IPAQ-SF). Menopause-related quality of life was measured using the Menopause-Specific Quality of Life Questionnaire (MENQOL). Statistical analyses were performed using SPSS version 26. Associations between variables were analyzed using chi-square test, ANOVA, Pearson correlation, and multivariate logistic regression. A p-value <0.05 was considered statistically significant. **Result**: Moderate menopausal symptoms were the most common (54%), followed by severe (25%) and mild (21%) symptoms, with a mean MRS score of 18.3 ± 6.4. Moderate physical activity was observed in 46% of participants, while 38% had low activity levels. A significant association was found between physical activity and symptom severity (χ^2=26.48, p<0.001). Higher physical activity levels were associated with significantly lower MENQOL scores across all domains (p<0.001). Physical activity showed a negative correlation with symptom severity and quality-of-life impairment. Multivariate analysis identified low physical activity (AOR=3.89), age ≥56 years (AOR=2.05), and BMI ≥30 kg/m² (AOR=1.72) as significant predictors of severe menopausal symptoms. **Conclusion**: Physical activity is significantly associated with reduced severity of postmenopausal symptoms and improved menopause-related quality of life.

Keywords: *Menopause, Postmenopausal syndrome, Physical activity, Menopause Rating Scale, MENQOL, Quality of life.*

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INTRODUCTION

Menopause, typically occurring around 50 years of age, represents a critical physiological transition characterized by cessation of ovarian follicular activity and a marked decline in estrogen production, precipitating multi-systemic alterations collectively manifesting as postmenopausal syndrome. [1]. The overall occurrence of menopausal symptoms among middle-aged women in developing countries is approximately 45.37% [2]. In Bangladesh, 28.2% of postmenopausal women reported moderate to severe vasomotor symptoms, such as hot flashes and night sweats, which are hallmark indicators of postmenopausal syndrome [3]. The onset and variable severity of postmenopausal syndrome are primarily rooted in biological changes but are also influenced by lifestyle factors, genetic predispositions, and individual health histories [4]. Postmenopausal syndrome results chiefly from the sharp decline in ovarian hormones after menopause, defined as 12 consecutive months of amenorrhea. Throughout reproductive life, cyclic estrogen and progesterone regulate menstruation and influence mood, bone maintenance, thermoregulation, and skin and urogenital health. Loss of ovarian function markedly reduces circulating estrogen, driving most postmenopausal symptoms through systemic receptor-mediated effects [5]. The systemic deficiency of estrogen exerts differential effects across organ systems. Vasomotor symptoms, including hot flashes and night sweats, result from disruption of hypothalamic thermoregulatory mechanisms, which become increasingly sensitive to declining estrogen. Urogenital atrophy, manifesting as vaginal dryness and urinary incontinence, occurs due to loss of estrogen-mediated maintenance of epithelial thickness and elasticity. Skeletal integrity is compromised as estrogen deficiency accelerates osteoclastic activity, leading to increased bone resorption and heightened fracture risk [6]. Genetic factors influence both the timing of menopause onset and individual physiological responses to estrogen deficiency, affecting processes such as thermoregulation and bone metabolism, thereby contributing to considerable inter-individual variability in postmenopausal symptomatology [7]. Lifestyle factors, including smoking, obesity, and physical inactivity, have been associated with increased severity of menopausal symptoms; smoking exerts anti-estrogenic effects that intensify vasomotor and mood disturbances, while sedentary behavior contributes to fatigue, weight gain, and reduced musculoskeletal strength commonly observed post-menopause [8]. Premature or surgically induced menopause, resulting from interventions such as chemotherapy, oophorectomy, or conditions like primary

ovarian insufficiency, leads to abrupt estrogen deficiency, often precipitating more severe and rapidly onset menopausal symptoms due to the lack of gradual physiological adaptation [9]. Pre-existing conditions, including hypertension, metabolic syndrome, and autoimmune disorders, can interact synergistically with menopausal hormonal changes, whereby postmenopausal metabolic and inflammatory shifts may modulate cardiovascular risk and cognitive function, highlighting the systemic nature of estrogen deficiency [10]. Menopause often impairs daily functioning and quality of life, with sleep disturbances and fatigue linked to depression, anxiety, musculoskeletal pain, and reduced productivity [11]. Postmenopausal women frequently experience poor sleep, cognitive difficulties, fatigue, mood fluctuations, and reduced life satisfaction, which can affect social engagement, work performance, and intimate relationships [12]. Menopausal symptoms impact not only physical health but also emotional and psychological well-being [13]. The aim of this study was to assess the severity of postmenopausal syndrome and examine its association with physical activity among postmenopausal women.

METHODS & MATERIALS

A cross-sectional analytical study was conducted to evaluate the severity of postmenopausal syndrome and its association with physical activity among postmenopausal women. The study was carried out January 2024 to December 2024 at the Department of Obstetrics and Gynecology, Bangladesh Medical University and some renowned private chamber, Dhaka, Bangladesh. A total of 200 postmenopausal women were included in the study. Postmenopause was defined as the absence of menstruation for at least 12 consecutive months not attributable to other medical causes, consistent with criteria described by the World Health Organization.

Inclusion and Exclusion Criteria

Inclusion Criteria

Participants were eligible if they:

- were aged 45–65 years,
- had experienced natural menopause for at least one year, and
- provided written informed consent.

Exclusion Criteria

Women were excluded if they:

- had surgical menopause (hysterectomy with bilateral oophorectomy),
- were receiving hormone replacement therapy,
- had severe chronic diseases such as malignancy or advanced cardiovascular disease, or
- were unable to complete the questionnaire.

Data Collection procedure

Data were collected through face-to-face interviews using a structured and pretested questionnaire administered by trained research personnel. The questionnaire included sections on sociodemographic characteristics, menopausal symptoms, and physical activity levels. Anthropometric measurements such as body weight and height were obtained following standard procedures, and body mass index (BMI) was calculated as weight in kilograms divided by height in meters squared (kg/m²). The severity of menopausal symptoms was evaluated using the Menopause Rating Scale (MRS), a validated instrument consisting of 11 items categorized into three domains: somatic, psychological, and urogenital symptoms. Each item is scored on a five-point Likert scale ranging from 0 (no symptoms) to 4 (very severe symptoms). The total score ranges from 0 to 44, with higher scores indicating greater symptom severity. Based on the total score, symptom severity was categorized as mild, moderate, or severe.

Physical activity levels were assessed using the International Physical Activity Questionnaire–Short Form (IPAQ-SF). The IPAQ measures the frequency and duration of walking, moderate-intensity, and vigorous-intensity activities performed during the previous seven days. Total physical activity was expressed as Metabolic Equivalent Task minutes per week (MET-minutes/week) according to the IPAQ scoring protocol. Participants were categorized into low, moderate, and high physical activity levels.

Menopause-related quality of life was assessed using the Menopause-Specific Quality of Life Questionnaire (MENQOL). The MENQOL evaluates four domains: vasomotor, psychosocial, physical, and sexual symptoms. Higher scores indicate greater impairment in menopause-related quality of life.

Statistical Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as frequencies and percentages. The association between physical activity levels and severity of menopausal symptoms was assessed using the Chi-square test. Differences in MENQOL scores across physical activity categories were analyzed using one-way analysis of variance (ANOVA). Pearson correlation analysis was used to determine the relationship between physical activity levels and menopausal symptom scores. A multivariate logistic regression analysis was conducted to identify independent predictors of severe menopausal symptoms after adjusting for potential confounders such as age, BMI, and educational status. A p-value < 0.05 was considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of the respective medical institution prior to the commencement of the study. Written informed consent was obtained from all participants. Confidentiality and anonymity of the participants were strictly maintained throughout the study.

RESULT

The mean age was 52.10±4.80 years. 30.00% of participants were between 45–50 years, 40.00% were 51–55 years, 22.50% were 56–60 years, and 7.50% were older than 60 years. 37.50% of participants had a BMI <25 kg/m². Educational attainment varied, with 35.0% of participants having completed secondary education. The majority of participants were married (81.00%), while 19.00% were widowed or divorced (*Table I*).

Table I
Baseline characteristics of the study population (*n* = 200).

Variable	Frequency (n)	Percentage (%)
Age (years)		
45–50	60	30.00
51–55	80	40.00
56–60	45	22.50
>60	15	7.50

Mean ± SD Age	52.1 ± 4.8	
BMI (kg/m²)		
<25	75	37.50
25–29.9	85	42.50
≥30	40	20.00
Education Level		
No formal	35	17.50
Primary	60	30.00
Secondary	70	35.00
Higher	35	17.50
Marital Status		
Married	162	81.00
Widowed/Divorced	38	19.00

Table II shows moderate symptoms were reported by the majority, accounting for 54.00% of participants, with a mean±SD MRS score of 17.50±3.60.

Table II
Postmenopausal symptom severity distribution (MRS) among the study population.

Severity Level	Frequency (n)	Percentage (%)	Mean ± SD MRS Score
Mild	42	21.00	10.8 ± 2.0
Moderate	108	54.00	17.5 ± 3.6
Severe	50	25.00	26.4 ± 3.8
Overall	200	100.00	18.3 ± 6.4

38.00% of participants were classified as having low activity levels, with a mean±SD MET-min/week of 560±125 (*Table III*). Nearly half of the study population (46.00%) engaged in moderate physical activity, corresponding to 1,250±215 MET-min/week.

Table III
Physical activity levels (IPAQ categories) among the study population.

Activity Level	Frequency (n)	Percentage (%)	Mean ± SD MET-min/week
Low	76	38.00	560 ± 125
Moderate	92	46.00	1,250 ± 215
High	32	16.00	2,050 ± 315

Table IV presents that 3.16% reported mild symptoms, 55.26% moderate symptoms, and 31.58% severe symptoms.

Table IV
Association of physical activity with severity of postmenopausal syndrome.

Physical Activity Level	Mild (n, %)	Moderate (n, %)	Severe (n, %)	χ^2	p-value
Low	10 (13.16)	42 (55.26)	24 (31.58)	26.48	<0.001
Moderate	24 (26.09)	58 (63.00)	10 (10.87)		
High	8 (25.00)	8 (25.00)	16 (50.00)		

Participants with low physical activity reported the highest domain scores: vasomotor 7.20±2.30, psychosocial 8.00±2.60, physical 10.80±3.40, sexual 4.20±1.70, and a total MENQOL score of 30.20±6.90 (*Table V*).

Table V
MENQOL domain scores by physical activity levels among the study population.

Physical Activity	Vasomotor (Mean±SD)	Psychosocial (Mean±SD)	Physical (Mean±SD)	Sexual (Mean±SD)	Total MENQOL
Low	7.2 ± 2.3	8.0 ± 2.6	10.8 ± 3.4	4.2 ± 1.7	30.2 ± 6.9
Moderate	5.5 ± 1.9	6.4 ± 2.3	8.6 ± 2.7	3.6 ± 1.4	24.1 ± 5.8
High	4.6 ± 1.5	5.2 ± 1.9	7.4 ± 2.3	3.1 ± 1.3	20.3 ± 4.9
ANOVA (F)	21.57	18.94	24.83	8.66	27.14
p-value	<0.001	<0.001	<0.001	0.001	<0.001
Pearson r (vs MET)	−0.41	−0.44	−0.48	−0.32	−0.50

Pearson correlation analysis further demonstrated moderate to strong negative associations between MET-min/week and domain scores (vasomotor r=−0.41, psychosocial r=−0.44, physical r=−0.48, sexual r=−0.32, total MENQOL r=−0.50). *Table VI* indicates the total MENQOL score was highly correlated with MRS (r=0.78, p<0.001). Domain-specific analyses revealed significant correlations as well: vasomotor (r=0.62, p<0.001), physical (r=0.74, p<0.001), psychosocial (r=0.69, p<0.001), and sexual (r = 0.48, p < 0.001).

Table VI
Correlation between symptom severity (MRS) and MENQOL scores among the study population.

Variables	Pearson Correlation (r)	p-value
MRS vs Total MENQOL	0.78	<0.001
MRS vs Vasomotor	0.62	<0.001
MRS vs Physical	0.74	<0.001
MRS vs Psychosocial	0.69	<0.001
MRS vs Sexual	0.48	<0.001

Low physical activity was strongly associated with severe symptomatology, with an adjusted odds ratio (OR) of 3.89 (95% CI: 2.10–7.21, p < 0.001) compared with high activity. Age ≥56 years also emerged as a significant predictor (OR = 2.05, 95% CI: 1.08–3.89, p = 0.028), as did obesity (BMI ≥30 kg/m²; OR = 1.72, 95% CI: 1.01–2.93, p = 0.047). Lack of regular exercise independently increased the odds of severe symptoms (OR = 2.42, 95% CI: 1.33–4.40, p = 0.004) (*Table VII*).

Table VII
Multivariate logistic regression predictors of severe menopausal symptoms among the study population.

Predictor	Adjusted OR	95% CI	p-value
Low Physical Activity (Ref: High)	3.89	2.10 – 7.21	<0.001
Age ≥56 yrs. (Ref: 45–50)	2.05	1.08 – 3.89	0.028
BMI ≥30 kg/m²	1.72	1.01 – 2.93	0.047
Secondary or lower education	1.56	0.95 – 2.57	0.08
No regular exercise	2.42	1.33 – 4.40	0.004

DISCUSSION

Postmenopausal syndrome represents a complex cluster of vasomotor, psychological, and somatic symptoms experienced by women after menopause, and increasing evidence suggests that lifestyle factors—particularly physical activity—may influence the severity of these symptoms [14]. The present study evaluated the severity of postmenopausal syndrome and its association with physical activity among 200 postmenopausal women. The findings demonstrate that menopausal symptoms were common and that physical activity showed a significant association with symptom severity and quality of life. Regarding baseline characteristics, the mean age of the participants was 52.1±4.8 years, with the highest proportion of women belonging to the 51–55 years age group (40.00%), followed by 45–50 years (30.00%), 56–60 years (22.50%), and >60 years (7.50%). In terms of BMI distribution, 42.50% of participants had BMI 25–29.9 kg/m², 37.50% had BMI <25 kg/m², and 20% were obese (BMI ≥30 kg/m²). Regarding educational status, 35% had secondary education, 30% had primary education, while 17.5% had no formal education and 17.5% had higher education. Most participants were married (81%), while 19% were widowed or divorced. These findings are consistent with previous studies by Jesmin et al. & Taziki et al. where the majority of postmenopausal women were in their early fifties with similar sociodemographic distributions [15,16]. In the present study, the distribution of menopausal symptom severity assessed using the Menopause Rating Scale (MRS) showed that 54% of women experienced moderate symptoms, 25% experienced severe symptoms, and 21% had mild symptoms. The mean MRS scores were 10.8±2.0 for mild symptoms, 17.5±3.6 for moderate symptoms, and 26.4 ± 3.8 for severe symptoms, with an overall mean MRS score of 18.3±6.4. These findings are consistent with earlier studies where moderate menopausal symptoms were the most prevalent. Nandan & Mohan, who validated the Menopause Rating Scale, also reported that most women fall within the mild-to-moderate symptom range, although a considerable proportion may experience severe symptoms depending on lifestyle and health status [17]. The distribution of physical activity levels in the present study demonstrated that 46% of women had moderate physical activity, 38% had low physical activity, and only 16% reported high physical activity. The mean MET-minutes per week were 560±125 for low activity, 1,250±215 for moderate activity, and 2,050±315 for high activity levels. These findings are consistent with previous studies utilizing the International Physical Activity Questionnaire (IPAQ), where moderate activity levels are most commonly observed among middle-aged women, while a significant proportion remain physically inactive [18]. The association between physical activity and severity of menopausal symptoms showed a statistically significant relationship (χ^2=26.48, p<0.001). Among women with low physical activity, 31.58% experienced severe symptoms, 55.26% had moderate symptoms, and 13.16% had mild symptoms. In contrast, among women with moderate physical activity, only 10.87% had severe symptoms, while 63% had moderate symptoms and 26.09% had mild symptoms. Although the high physical activity group showed 50% severe symptoms, this group represented only 16% of the total sample. Overall, the findings demonstrate that lower physical activity was associated with higher symptom severity. Similar associations have been reported in earlier studies. Elavsky and McAuley (2005) & Wu et al., reported that physically active menopausal women experienced significantly fewer menopausal symptoms compared with sedentary women, suggesting that regular exercise may alleviate symptom severity [19,20]. Quality of life analysis using the MENQOL scale further demonstrated the beneficial effects of physical activity. Women with low physical activity had higher domain scores indicating poorer quality of life, including vasomotor (7.2±2.3), psychosocial (8.0±2.6), physical (10.8±3.4), sexual (4.2±1.7), and total MENQOL score (30.2±6.9). In contrast, women with moderate activity had lower scores (5.5±1.9, 6.4 ± 2.3, 8.6±2.7, 3.6±1.4, total 24.1±5.8), while those with high activity showed the lowest scores (4.6±1.5, 5.2±1.9, 7.4±2.3, 3.1±1.3, total 20.3±4.9). The differences across groups were statistically significant (p<0.001 for vasomotor, psychosocial, and physical domains; p=0.001 for sexual domain; and p<0.001 for total MENQOL). Pearson correlation analysis showed significant negative correlations between MET values and MENQOL scores, including −0.41 for vasomotor, −0.44 for psychosocial, −0.48 for physical, −0.32 for sexual, and −0.50 for total MENQOL. These findings are consistent with previous research where increased physical activity significantly improved menopausal quality of life across multiple domains. Kim et al., Barati et al. and Moilanen et al. similarly reported that physically active women had significantly lower MENQOL scores compared with inactive women [21-23]. The correlation analysis between menopausal symptom severity and quality of life revealed a strong positive association

between MRS and MENQOL scores. The correlation between MRS and total MENQOL was r=0.78 (p<0.001), indicating that increased symptom severity was strongly associated with poorer quality of life. Significant correlations were also observed between MRS and vasomotor (r=0.62), physical (r=0.74), psychosocial (r = 0.69), and sexual domains (r=0.48), all with p < 0.001. These findings are consistent with previous studies showing that menopausal symptom severity has a substantial impact on overall health-related quality of life [24]. Multivariate logistic regression analysis identified several predictors of severe menopausal symptoms. Women with low physical activity had nearly four times higher odds of severe symptoms (adjusted OR = 3.89, 95% CI: 2.10–7.21, p < 0.001) compared with those with high physical activity. Additionally, age ≥56 years was associated with increased risk (OR=2.05, 95% CI: 1.08–3.89, p=0.028), as was BMI ≥30 kg/m² (OR=1.72, 95% CI: 1.01–2.93, p=0.047). Absence of regular exercise also significantly increased the likelihood of severe symptoms (OR = 2.42, 95% CI: 1.33–4.40, p = 0.004). Although lower educational status showed a higher odds ratio (OR=1.56), it did not reach statistical significance (p=0.08). These findings align with previous studies showing that physical inactivity, obesity, and advancing age are important predictors of severe menopausal symptoms. Blümel et al. and Fernández et al. similarly reported that sedentary lifestyle and higher BMI significantly increase menopausal symptom burden [25,26].

LIMITATIONS

This study has several limitations. The cross-sectional design limits the ability to establish causal relationships between physical activity and the severity of postmenopausal symptoms. Physical activity levels were assessed using self-reported questionnaires, which may be subject to recall bias and reporting inaccuracies. The study was conducted in a limited geographical area of Bangladesh, which may restrict the generalizability of the findings to broader populations. Additionally, other potential influencing factors such as dietary habits, psychological stress, and hormonal profiles were not evaluated.

CONCLUSION

This study demonstrates that postmenopausal syndrome is highly prevalent among postmenopausal women, with the majority experiencing moderate to severe symptoms. Physical activity showed a significant association with symptom severity and menopause-related quality of life. Women with moderate levels of physical activity reported lower Menopause Rating Scale (MRS) scores and better MENQOL outcomes across vasomotor, psychosocial, physical, and sexual domains. In contrast, low physical activity was identified as an independent predictor of severe menopausal symptoms. Additionally, advancing age and higher BMI were also associated with increased symptom severity. These findings highlight the potential role of regular physical activity as a non-pharmacological strategy for mitigating menopausal symptoms and improving overall well-being among postmenopausal women.

FUNDING

No funding sources

CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee.

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