

ANALYSING THE BENEFIT AND EFFECT OF PHYSICAL ACTIVITY DURING
MENOPAUSE

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ABSTRACT

Objective: The primary goal of this study is to investigate the impact of physical activity (PA) levels, as well as medical, sociodemographic, and lifestyle factors, on the relationship between menopause-related discomforts and women's quality of life (QOL).

Materials and method: A non-randomized cross-sectional study was conducted using an online questionnaire in 2022. The study utilized the MENQOL questionnaire to evaluate menopause-related symptoms and the GPAQ (version 2) questionnaire to assess physical activity. The SF-36 and a self-made demographic questionnaire were used to determine the quality of health and socioeconomic data. Statistical analysis and recordings were performed with Microsoft Excel and SPSS 23 software using descriptive statistics and Spearman's correlation. The level of significance was set at $p < 0.05$.

Result: The sample consisted of 138 women, all of whom were in the menopause age range, with an age range of 46 to 80 years and an average age of $57.10 \text{ years} \pm 6.20$. Most participants were married (64.5%) and were from Nigeria (70.29%). The study also investigated the participants' physical activity levels and their menopausal status. The results showed significant association between the level of physical activity and menopausal status. ($p = 0.031$) The study found that engaging in more physical activity tended to lead to higher quality of life, with a weak positive correlation between physical activity and quality of life ($r = 0.015$, $p < 0.001$). The study also found a weak positive correlation between menopause symptoms and quality of life ($r = 0.094$, $p = 0.01$), indicating that menopausal status may be associated with lower quality of life.

Conclusion: The study shows that physical activity has a positive impact on the quality of life of menopausal women. It emphasizes the need to promote regular physical activity as part of personalized menopausal healthcare, considering individual factors such as age, education, and employment status.

Keywords: Women, Menopause, physical activity, MENQOL

Introduction

Menopause marks a significant transition in a woman's life, characterized by the natural cessation of reproductive function. This stage, typically occurring in the mid-40s to 50s, involves a decline in ovarian function and hormonal changes, primarily a decrease in estrogen and an increase in follicle-stimulating hormone (FSH) (El Hajj et al., 2020). These hormonal shifts result in various physical and psychological symptoms that can adversely affect women's quality of life (QOL) during this period. Symptoms include hot flashes, night sweats, mood fluctuations, sleep disturbances, and an increased risk of metabolic and cardiovascular diseases, osteoporosis, and weight gain. The onset and intensity of these symptoms vary across individuals, with lifestyle, genetics, and socio-economic factors playing significant roles.

Menopause is a natural phase of aging, and managing its symptoms is key to overall health. Physical activity (PA) plays a vital role in reducing menopause-related discomforts, including weight gain, anxiety, depression, and sleep disturbances. Studies show that regular exercise lessens symptom severity and improves quality of life (QOL), while also enhancing mental and physical health, lowering the risk of chronic conditions like cardiovascular disease and diabetes, and improving sleep quality. (Dąbrowska-Galas, Dąbrowska, Ptaszkowski, & Plinta, 2019)

Although hormone replacement therapy (HRT) is a popular treatment option for alleviating menopausal symptoms, concerns about its potential adverse effects have led many women to explore alternative therapies (Kim, Cho, Ahn, Yim, & Park, 2014). PA stands out as a non-pharmacological intervention that can effectively improve both physical and mental well-being during menopause. Despite the known benefits of PA, many women remain unaware of its potential in managing menopausal symptoms. This highlights the need for healthcare professionals to actively promote PA and other healthy lifestyle habits as part of comprehensive menopausal care.

The purpose of this study is to evaluate the impact of PA, along with medical, socio-demographic, and lifestyle factors, on the quality of life of menopausal women. By examining the relationship between PA and menopausal symptoms, this research aims to provide insights into the role of PA as an essential component of personalized care during menopause

Methods

Study design

This research was a non-randomized, cross-sectional study conducted between September 2022 and January 2023. Participants were recruited online from diverse locations, including Nigeria and Hungary.

Participants and sampling

A total of 180 women were invited to participate in the study using a convenience sampling technique. The inclusion criteria were women aged 45 years or older, who had experienced natural cessation of menstruation for at least 12 months (i.e., menopausal), and who did not have any physical limitations that would interfere with the assessment of daily physical activity (PA). Women who had undergone induced menopause due to hysterectomy, radiation therapy, or other medical procedures were excluded from the study, as well as those who were pregnant, breastfeeding, or had mental or cognitive impairments. After applying these criteria, 132 women were included in the final analysis. These women were further divided into two subgroups based on the time since menopause: those who had experienced menopause 5 years or less ago were categorized as perimenopausal, while those who had experienced menopause more than 5 years ago were classified as postmenopausal (Ambikairajah et al., 2022; Grochans et al., 2018; Juang et al., 2005).

Data collection

The socio-demographic section collected information on education level (grouped into primary, secondary, university, postgraduate diploma, and doctorate/Ph.D.), marital status (categorized as single, married, divorced, or widowed), and parity (number of children). Smoking status was determined by the number of packs smoked daily, while alcohol consumption was categorized as never, monthly, weekly, daily, or other. Employment status was assessed with the question, "What do you do for a living?" The questionnaire also included questions on childbirth, pregnancy, medication, menstrual cycle, chronic diseases, height, weight (to calculate BMI), contraceptive use, menopausal hormone therapy, age, and country of birth.

The Menopause-Specific Quality of Life Questionnaire (MENQOL) was used to assess menopause-related symptoms. Developed by Hilditch et al., 1996, the scale was designed to reflect women's experiences of menopause. The Hungarian adaptation and validation of this scale was completed by Lewis, Hilditch, and Wong (2005). The MENQOL consists of 29 items

across four domains: vasomotor (items 1-3), psychosocial (items 4-10), physical (items 11-26), and sexual (items 27-29). Participants indicated the presence of each symptom using a "yes" or "no" option and ranked the severity on a scale from 0 (not at all bothered) to 6 (extremely bothered).

The Global Physical Activity Questionnaire (GPAQ) was developed by the World Health Organization (WHO) in 2002 as part of the Stepwise Approach to Chronic Disease Risk Factor Surveillance. In their 2004 Global Strategy on Diet, Physical Activity, and Health, the WHO recommended its use for national physical activity surveillance. Bull, Maslin, and Armstrong (2009) assessed the GPAQ's validity and reliability across nine countries. In this study, the English version of the GPAQ was used due to its appropriateness for the Nigerian context. The GPAQ was validated for use in Hungary by Ács et al., (2020) and has been adapted to various populations worldwide. The questionnaire consists of 16 questions evaluating physical activity across three domains: work, transportation, and leisure, as well as time spent sedentary. For this study, specific GPAQ items focused on daily physical activity: "How many days a week do you engage in moderate-to-vigorous level physical exercise?" and "How many hours a week do you typically spend engaging in moderate-to-strenuous physical activity?" Walking frequency was used as a measure of mild physical activity.

The 36-Item Short Form Survey (SF-36), developed by the Boston Health Research Institute, is widely used to assess general health status. The Hungarian validation of the SF-36 was carried out by Czimbalmos, Nagy, Varga, and Husztik (1999), providing a reference for the standard values in the local population. In this study, the original English version of the SF-36 was used to ensure compatibility with the Nigerian context. The SF-36 consists of eight dimensions, covering physical functioning, bodily pain, role limitations due to physical and emotional problems, social functioning, mental health, vitality, and general health perceptions. The scores for each dimension range from 0 (poorest health) to 100 (best health). (Brazier et al., 1992)

All data were collected anonymously, and participants received the questionnaires via email links with instructions to complete the forms independently.

Statistical analysis

Data were analyzed using IBM SPSS Statistics (version 23) and Microsoft Excel. Descriptive statistics, including frequencies, percentages, means, and standard deviations, summarized participant demographics and questionnaire responses. Spearman's rank correlation was used

to examine the association between physical activity and menopausal symptoms, while an independent samples t test was applied to compare the differences between groups. A significance level of $p < 0.05$ was considered for all analyses.

Ethical considerations

This study adhered to the principles outlined in the Declaration of Helsinki. All participants provided informed consent electronically before taking part in the study. All participants voluntarily answered the questionnaire and had the option to opt out of the research at any time.

Result

Socio-demographic and health characteristics

The main socio-demographic and health characteristics of the participants are summarized in Table 1. A total of 138 women (57.10 ± 6.20 years) participated in the study. The majority of the participants (44.20%) were between 51 and 56 years of age. Educational achievement was varied, with 33.33% holding a university degree and 25.36% a postgraduate diploma. Employment was prevalent, with 75.36% of the participants employed at the time of the study.

Regarding menopausal status, 56.52% were perimenopausal, while 43.48% were postmenopausal. In terms of perceived health, 29.71% rated their health as good, while 30.43% described it as neither good nor bad. A smaller percentage (7.25%) reported excellent health. Almost all participants (99.28%) had never used menopausal hormone therapy, and none had ever used oral contraceptive pills.

The majority of the participants were from Nigeria (70.29%), with a smaller proportion from Hungary (20.29%). In terms of childbirth history, 73.19% had delivered via vaginal birth. The mean time since menopause was 6.01 ± 5.14 years, and the participants reported an average sleep quality score of 84.49 ± 20.08 . The health-related quality of life of participants, as assessed by the SF-36, revealed relatively strong outcomes in emotional well-being and social functioning. Overall, the sample represented a diverse group of middle-aged women with varying health and lifestyle characteristics.

Table 1. Socio-demographic and Health Characteristics of the Participants

Variable	Level	N	%
	45-50	14	10.14
	51-56	61	44.20

Age by group	57-62	43	31.16
	63-68	13	9.42
	69-74	3	2.17
	75-80	4	2.90
Educational level	Primary school	27	19.57
	Secondary school	23	16.67
	University	46	33.33
	Postgraduate diploma	35	25.36
	Doctorate (PhD/DBA)	7	5.07
Employment	Yes	104	75.36
	No	34	24.64
Menopausal status	Perimenopausal	78	56.52
	Postmenopausal	60	43.48
Perceived health status	Poor	7	5.07
	Fair	38	27.54
	Neither good nor bad	42	30.43
	Good	41	29.71
	Excellent	10	7.25
Marital status	Single	12	8.70
	Married	89	64.49
	Divorced	18	13.04
	Widow	19	13.77
Smoking	Yes	27	19.57
	No	111	80.43
Use of menopausal hormone therapy	Current users	0	0.00
	Past users	1	0.72
	Never used	137	99.28
Use of oral contraceptive pills	Used	0	0.00
	Never used	138	100.00
Home country	Nigeria	97	70.29
	Hungary	28	20.29
	Others	13	9.42
Child delivery	Vaginal birth	101	73.19
	Cesarean section	7	5.07
	Others	30	21.74
		Mean	SD
Time since menopause (years)		6.01	5.14
Age (years)		57.10	6.20
Self-evaluation of sleep quality		84.49	20.08

N = number of participants; SD = standard deviation; % = percentage.

Mean scores of MENQOL's subdomains, psychosocial subdomain, physical subdomain and sexual subdomain

Table 2 presents the mean scores of the MENQOL's subdomains, including Vasomotor, Psychosocial, Physical, and Sexual subdomains for pre/perimenopause and post-menopause groups. The table also includes the standard deviation (SD) and p value for the comparison of mean scores between the two groups. The results indicate that there were significant differences in the mean scores of the Vasomotor subdomain between pre/perimenopause and post-

menopause groups ($p=0.008$). Similarly, significant differences were found in the Psychosocial ($p=0.0002$), Physical ($p<0.001$), and Sexual ($p<0.001$) subdomains. In most cases, pre/perimenopausal women reported slightly higher mean scores than postmenopausal women, indicating that they were more likely to experience symptoms in these areas.

Table 2. Mean scores of MENQOL's subdomains, psychosocial subdomain, physical subdomain and sexual subdomain

MENQOL subdomains	Menopausal statue	N	Mean	SD	p value
Vasomotor Subdomain	Pre/peri- menopause	78	3.55	1.17	0.008
	Post- menopause	60	3.54	1.37	
Psychosocial Subdomain	Pre/peri- menopause	78	3.59	1.24	0.0002
	Post- menopause	60	3.54	1.35	
Physical Subdomain	Pre/peri- menopause	78	3.63	1.19	$p<0.001$
	Post- menopause	60	3.49	1.36	
Sexual Subdomain	Pre/peri- menopause	78	3.54	1.05	$p<0.001$
	Post- menopause	60	3.35	1.3	

N = number of participants; SD = standard deviation; MENQOL = Menopause-Specific Quality of Life. * $p < 0.05$

Physical activity level

Table 3 shows the descriptive statistics for the physical activity engaged by the participants. The participants engage in different types of physical activities, including work-related, transport-related, recreational, and sitting activities. Participants engaged in an average of 118.41 ± 398.58 min/week of vigorous PA at work and 116.88 ± 177.62 min/week of moderate PA at work. However, the mean values (0.0) indicate that vigorous PA at work is not common in this group.

For transportation-related activity, participants averaged 115.14 ± 96.61 min/week, with a MET expenditure of 460.55 ± 386.45 . Recreational vigorous PA was low, averaging only 32.03 ± 150.69 min/week, while moderate recreational activity was preferred, with participants averaging 90.29 ± 107.51 min/week. Participants spent an average of 75.29 ± 45.85 min/day sitting, indicating a considerable amount of sedentary time. The total physical activity per week,

combining all types and intensities, was around 472.75 ± 931.01 min/week, with a corresponding total MET value of 2492.72 ± 5921.12 .

Table 3. Descriptive statistics showing the physical activity engaged by the participants

Measure	Mean	SD	Median	IQR Lower	IQR Upper
PA by domains Work – vigorous PA					
min/week	118.41	398.579	0.00	0.00	0.00
MET	947.25	3188.629	0.00	0.00	0.00
Work – moderate PA					
min/week	116.88	177.617	30.00	0.00	152.50
MET	467.54	710.469	120.00	0.00	610.00
Transport					
min/week	115.14	96.613	90.00	50.00	200.00
MET	460.55	386.454	360.00	200.00	800.00
Recreation - vigorous PA					
min/week	32.03	150.691	0.00	0.00	0.00
MET	256.23	1205.531	0.00	0.00	0.00
Recreation - moderate PA					
min/week	90.29	107.508	60.00	0.00	180.00
MET	361.16	430.032	240.00	0.00	720.00
Sitting					
min/day	75.29	45.845	60.00	40.00	90.00
Total PA min/week	472.75	931.009	180.00	50.00	532.50
Total MET	2492.72	5921.115	720.00	200.00	2130.00

SD = standard deviation; PA = Physical Activity; IQR Lower = lower quartile; IQR Upper = Upper quartile; MET = Metabolic Equivalent of Task

Relationship between GPAQ questionnaire and the SF-36 questionnaire

Table 4 presents the correlation coefficients and significance levels between different types of physical activity and various health-related outcomes, including physical functioning, emotional problems, energy, well-being, social functioning, pain, and general health.

Moderate positive correlations were observed between moderate work activity and various health-related outcomes, including physical health ($r = 0.234$, $p = 0.006$), emotional problems ($r = 0.202$, $p = 0.018$), well-being ($r = 0.308$, $p = 0.000$), pain ($r = 0.228$, $p = 0.007$), and general health ($r = 0.222$, $p = 0.009$). Additionally, active transportation was positively correlated with energy ($r = 0.249$, $p = 0.003$).

Recreational vigorous activity showed a positive correlation with social functioning ($r = 0.193$, $p = 0.023$). In contrast, recreational moderate activity demonstrated a negative correlation

with social functioning ($r = -0.302$, $p = 0.000$) and pain ($r = -0.180$, $p = 0.034$). For daily average sitting time, negative correlations were found with emotional problems ($r = -0.175$, $p = 0.041$) and energy ($r = -0.218$, $p = 0.010$). Finally, total physical activity was positively correlated with physical health ($r = 0.227$, $p = 0.007$), well-being ($r = 0.260$, $p = 0.002$), and general health ($r = 0.292$, $p = 0.001$).

Table 4. Correlation analysis showing the relationship between physical activities, and quality of life

SF - 36									
GPAQ		Physical Function	Physical Health	Emotional Problems	Energy	Well Being	Social Functioning	Pain	General Health
Vigorous Work	r	-0.065	-0.078	-0.008	-0.143	-0.078	-0.127	-0.147	0.066
	p	0.449	0.363	0.922	0.094	0.360	0.136	0.085	0.439
Moderate Work	r	0.149	,234**	,202*	0.112	,308**	0.127	,228**	,222**
	p	0.080	0.006	0.018	0.191	0.000	0.136	0.007	0.009
Active Transportation	r	0.041	0.139	-0.070	,249**	0.118	-0.038	0.127	0.163
	p	0.635	0.103	0.415	0.003	0.169	0.656	0.139	0.056
Recreational Vigorous	r	0.007	0.027	-0.159	0.047	-0.001	,193*	0.098	0.134
	p	0.937	0.758	0.062	0.584	0.991	0.023	0.253	0.117
Recreational Moderate	r	0.004	0.024	0.090	-0.013	0.093	-,302**	-,180*	0.112
	p	0.967	0.783	0.295	0.881	0.277	0.000	0.034	0.190
Daily Sitting	r	0.153	0.011	-,175*	-0.018	-,218*	-0.012	-0.118	-0.111
	p	0.073	0.894	0.041	0.837	0.010	0.886	0.166	0.193
Total Physical Activity	r	0.142	,227**	0.006	0.133	,260**	-0.077	0.050	,292**
	p	0.097	0.007	0.948	0.119	0.002	0.369	0.559	0.001

SF-36 = 36-Item Short Form Health Survey; GPAQ = Global Physical Activity Questionnaire.

* $p < 0.0$

Relationship between of physical activity and menopausal status

Table 5 shows the correlation coefficients representing the relationship between different types of physical activity, as measured by the GPAQ, and the various subdomains of menopause-related quality of life (MENQOL), including vasomotor, psychosocial, physical, and sexual domains. Significant correlations were found between MENQOL subdomains and different physical activity types measured by GPAQ. For vigorous work, weak negative correlations were observed with the vasomotor domain ($r = -0.218$, $p = 0.010$), psychosocial domain ($r = -0.191$, $p = 0.025$), physical domain ($r = -0.176$, $p = 0.039$), and sexual domain ($r = -0.183$, $p = 0.032$).

Similarly, recreational vigorous activity showed moderate negative correlations with the vasomotor domain ($r = -0.276$, $p = 0.001$), psychosocial domain ($r = -0.241$, $p = 0.004$), physical domain ($r = -0.244$, $p = 0.004$), and sexual domain ($r = -0.182$, $p = 0.032$).

In terms of total physical activity, stronger negative correlations were identified across all MENQOL domains, including the vasomotor domain ($r = -0.284$, $p = 0.001$), psychosocial domain ($r = -0.398$, $p = 0.000$), physical domain ($r = -0.288$, $p = 0.001$), and sexual domain ($r = -0.311$, $p = 0.000$).

Table 5. Correlation analysis showing the relationship between menopause and physical activities

MENQOL					
GPAQ		Vasomotor Subdomain	Psychosocial Subdomain	Physical Subdomain	Sexual Subdomain
Vigorous Work Activity	r	-,218*	-,191*	-,176*	-,183*
	p	0.010	0.025	0.039	0.032
Recreational Vigorous Activity	r	-,276**	-,241**	-,244**	-,182*
	p	0.001	0.004	0.004	0.032
Total Physical Activity	r	-,284**	-,398**	-,288**	-,311**
	p	0.001	0.000	0.001	0.000

MENQOL = Menopause-Specific Quality of Life Questionnaire; GPAQ = Global Physical Activity Questionnaire. * $p < 0.05$

Relationship between menopause, physical activities, socio-demographic factors and quality of life

Table 6 presents the results of a correlation analysis that aimed to investigate the relationships between menopause, physical activity, socio-demographic factors and quality of life. The analysis was based on a sample of 138 participants. Several significant correlations were observed. total physical activity (total PA) was significantly associated with various quality of life domains. Specifically, physical health showed a correlation with total PA ($r = 0.227$, $p = 0.007$). Well-being was also significantly correlated with total PA ($r = 0.260$, $p = 0.002$), along with general health ($r = 0.292$, $p = 0.001$).

Negative correlations were found between total PA and certain menopause-related domains, including vasomotor domain ($r = -0.284$, $p = 0.001$) and psychosocial subdomain ($r = -0.398$, $p = 0.000$). Additionally, physical domain ($r = -0.288$, $p = 0.001$) and sexual domain ($r = -0.311$, $p = 0.000$) were negatively correlated with total PA.

Among socio-demographic factors, age was positively correlated with total PA ($r = 0.340$, $p = 0.000$), while years since menopause showed a negative correlation with total PA ($r = -0.197$, $p = 0.020$). Education also showed a significant negative correlation with total PA ($r = -0.238$, $p = 0.005$).

Table 6. Correlation analysis showing the essential relationship between menopause, physical activities, and quality of life

		MENQOL + SF-36 + Sociodemographic									
GPAQ		Physical Health	Well Being	General Health	Vasomotor Domain	Psychosocial Subdomain	Physical Domain	Sexual Domain	Education	Age	Years since menopause
Total PA	r	0.227	0.260	0.292	-0.284	-0.398	-0.288	-0.311	-0.238	0.34	-0.197
	p	0.007	0.002	0.001	0.001	0.000	0.001	0.000	0.005	0.000	0.020

MENQOL = Menopause-Specific Quality of Life Questionnaire; SF-36 = 36-Item Short Form Health Survey; GPAQ = Global Physical Activity Questionnaire. * $p < 0.05$

Discussion

The findings of this study support the hypothesis that physical activity (PA) has a positive influence on the quality of life (QOL) in menopausal women. Consistent with previous research, our results demonstrate that women who engage in regular physical activity report

better outcomes across various domains of menopausal symptoms, including vasomotor, psychosocial, physical, and sexual aspects.

One of the most significant findings of this study is the negative correlation between total physical activity and menopausal symptoms across all MENQOL domains, indicating that higher levels of physical activity are associated with fewer menopausal symptoms. Specifically, total physical activity was strongly negatively correlated with the psychosocial domain ($r = -0.398$, $p < 0.001$), suggesting that regular physical exercise may play a vital role in mitigating psychological symptoms such as mood swings, anxiety, and depression, which are common during menopause. This aligns with the conclusions of Sternfeld and Dugan (2011) who emphasize the benefits of exercise for both psychological and physical well-being during menopause.

The positive correlations between physical activity and general health outcomes, as measured by the SF-36, further reinforce the argument for incorporating physical activity into menopausal healthcare. Total physical activity was positively correlated with overall well-being ($r = 0.260$, $p = 0.002$), general health ($r = 0.292$, $p = 0.001$), and physical health ($r = 0.227$, $p = 0.007$), suggesting that active lifestyles contribute to improved health perceptions and fewer limitations in daily activities.

Interestingly, the study also found a significant relationship between recreational vigorous physical activity and social functioning, as well as energy levels, highlighting the importance of including structured recreational activities in post-menopausal care programs. These findings are in line with previous studies, such as those by Liu, Chen, Mielke, McCarthy, & Bailey, (2022), which confirm the effectiveness of structured exercise in improving social engagement and reducing fatigue among menopausal women.

In contrast, sedentary behavior, particularly time spent sitting, was found to have negative effects on emotional problems and energy levels, indicating that inactivity may exacerbate certain menopausal symptoms. This reinforces the need for interventions aimed at reducing sedentary time in favor of more active lifestyles.

It is also worth noting the socio-demographic factors associated with physical activity levels in this study. For instance, education was negatively correlated with total physical activity,

indicating that more educated women may be less physically active. This may be due to the nature of their employment or lifestyle factors, suggesting that future interventions should consider tailored approaches to encourage physical activity across different educational backgrounds. Furthermore, age showed a positive correlation with total physical activity ($r = 0.340$, $p < 0.001$), suggesting that older women in our sample are more likely to engage in physical activity, potentially due to greater awareness of its benefits. This is highlighted in a study by Matthews et al. (2009), who noted the positive impact of socio-economic factors on menopausal health.

The low reported use of hormone replacement therapy (HRT) and contraceptives in our sample highlights a growing trend towards non-pharmacological interventions to manage menopause-related symptoms. This cautious approach is reflective of findings from the Women's Health Initiative (Rossouw et al., 2002), which raised concerns about the long-term risks associated with HRT. In light of these concerns, promoting physical activity as a safe and effective alternative is particularly important.

The diverse background of the participants in this study, predominantly from Nigeria and Hungary, adds an important dimension to the findings, as it highlights how socio-cultural and geographic factors can influence the impact of physical activity on menopause-related symptoms. Research has shown that cultural norms, access to healthcare, lifestyle habits, and even climate can affect how menopausal symptoms are experienced and managed across different populations (El Hajj et al., 2020). For example, women from regions with warmer climates, such as Nigeria, may experience more intense vasomotor symptoms like hot flashes, due to the additional environmental heat stress. On the other hand, Hungarian women, who generally have greater access to healthcare resources, may benefit from more structured healthcare interventions, including counseling on physical activity.

This cultural diversity underscores the importance of personalized care approaches that account for regional differences in menopausal symptomatology and access to resources. Additionally, it reinforces the need for cross-cultural validation of tools like the MENQOL and GPAQ, which were used in this study. The fact that these tools have been validated in both Hungarian and Nigerian contexts (Ács et al., 2020; Lewis et al., 2005) strengthens the reliability of the findings but also highlights the importance of ensuring that interventions are culturally appropriate.

Including women from various countries highlights the universal benefits of physical activity for menopausal women while stressing the need to consider cultural and socio-economic contexts in healthcare recommendations. For example, promoting exercise may require different strategies in places with limited access to gyms or safe outdoor spaces. Future research should explore these cultural differences to better support diverse populations of menopausal women

Summary

In conclusion, this study underscores the critical role of physical activity in improving the quality of life of menopausal women. It highlights the importance of integrating exercise programs into healthcare plans for women during menopause, with a particular focus on reducing sedentary behavior and promoting recreational physical activities. Future research should aim to explore these relationships further, particularly through longitudinal studies that can better capture the long-term effects of physical activity on menopausal health outcomes.

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