

# Research Paper: Association Between Physical Activity and Post menopausal Symptoms in Saudi Women: A Cross-sectional Study



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## ABSTRACT

**Objectives:** Menopause is the termination of a woman's menstrual cycle for a year. In this condition, women's health status declines due to hormonal changes and aging. Physical Activity (PA) is among the best available alternatives for managing menopause-related symptoms without any adverse effects. This study aimed to assess the relationship between PA and symptoms, such as fatigue, depression, and insomnia in Saudi menopausal women.

**Methods:** This cross-sectional study involved 60 menopausal women; they were divided into physically active and inactive groups. The group allocation was conducted based on their PA level determined by the International Physical Activity Questionnaire Short-Form (IPAQ-SF). Menopausal symptoms, such as fatigue, depression, and insomnia were assessed using the Fatigue Severity Scale (FSS), Beck Depression Inventory-II (BDI-II), and Insomnia Severity Index (ISI), respectively, in the study groups. The association between PA and fatigue, depression, and insomnia was assessed using the Pearson correlation coefficient. The significance level was set at  $P \leq 0.05$ .

**Results:** Fatigue, depression, and insomnia were more prevalent in physically inactive post-menopause women than the active women. A significant difference was observed in the outcome variables between the study groups. Furthermore, a significant association was detected between PA and fatigue, depression, and insomnia in the study participants.

**Discussion:** Half of the explored menopausal women were physically active. Physically active menopausal women presented less fatigue, depression, and insomnia, compared to their inactive counterparts. This study suggested that PA positively impacted menopausal symptoms (fatigue, insomnia, & depression). Besides, the collected results highlighted the importance of physical activity among menopausal women.

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## Highlights

- Half of the studied menopausal women were physically active.
- Physically active menopausal women presented less fatigue, as well as low levels of depression and insomnia.
- Physical activity positively impacted menopausal symptoms (i.e., fatigue, insomnia, & depression).

## Plain Language Summary

Menopause is the end of a woman's menstrual cycle for one year. At this time, women's health declines due to hormonal changes and aging. Menopause usually occurs between 45 and 50 years of age and is considered a critical period in a women's life. The most common symptoms among menopausal women are vasomotor conditions, such as vaginal dryness, hot flashes, joints pain, insomnia, irritability, mood swings, and fatigue. Menopausal symptoms can be managed by hormone replacement therapy; however, exercise is among the best available alternative for managing menopause-related symptoms without adverse effects. Physical has many positive health benefits and is an effective way to prevent symptoms related to menopause. Evidence suggested beneficial physical activity effects; however, there is a lack of evidence on exercise and menopausal symptoms in Saudi women. This study aimed to examine the relationship between physical activity and menopause-related symptoms, such as fatigue, insomnia, and depression in Saudi women.

### 1. Introduction

**M**enopause, an essential aspect of a women's life, is the termination of the menstrual cycle for a year and usually occurs between 45 and 50 years of age. It marks the end of the fertility period and women's health status declines due to hormonal changes and aging. It is usually associated with bodily changes, leading to biopsychological, hormonal, and emotional alternations [1]. The most frequent symptoms among 80% of menopausal women are vasomotor symptoms, such as night sweats, joints problems, and fatigue [1, 2]. The age of natural menopause in Saudi women is 50 years. Besides, sociodemographic, reproductive, and lifestyle characteristics may affect menopausal symptoms [3]. Menopausal symptoms might be severe in women who do not exercise regularly [4].

Menopausal symptoms can be managed by hormone replacement therapy; however, exercise is among the best available alternatives for managing menopause-related symptoms without adverse effects [5]. Physical Activity (PA) is any bodily movement produced by skeletal muscle contraction that requires energy expenditure. Furthermore, it provides numerous positive health benefits; it is also an effective approach to prevent symptoms related to menopause [6]. Depression, insomnia, and fatigue are some of the most prevalent menopause-related symptoms. Numerous studies suggested that PA significantly reduces depression [7]; however, other

studies found that exercise can only affect general conditions, such as biopsychosocial symptoms [7]. However, PA may not significantly influence sexual and vasomotor symptoms [8]. In the early years of menopause, women are highly vulnerable to depressive symptoms. Accordingly, clinicians should regularly consider screening women for any symptoms of depression or other disorders. Subsequently, immediate treatment should be initiated if necessary.

Another most troubling clinical manifestation among 50%-75% of menopausal women is sleep disturbance/insomnia [9] that negatively impacts life quality [10]. There is a bidirectional relationship between insomnia and depression; insomnia can be a consequence of clinical depression or instigate mood swings [11]. In some women, decreased estrogen levels may generate hot flashes in the upper body; it may also result in fatigue that interferes with Daily Living Activities (DLAs). Women with signs of menstrual fatigue may experience irritability, as well as reduced attention and wakefulness. Furthermore, menopause-related fatigue may adversely affect mood, sleep, and Quality of Life (QoL) [12]. A retrospective study performed in China signified that depression, insomnia, and fatigue were prevalent among menopausal women [12].

Alquaiz et al. assessed the relationship between women's lifestyles and menopausal symptoms [3]. They concluded that obese and physically inactive females were more prone to experiencing severe menopausal symp-

toms [3]. Evidence indicated the positive impact of PA on menopausal symptom severity; however, data concerning the relationship between physical activity and post-menopausal symptoms in Saudi women remain scarce. Thus, the present study aimed to examine the relationship between physical activity and menopause-related symptoms, i.e., fatigue, depression, and insomnia in Saudi women.

## 2. Methods

This cross-sectional study was conducted from September 2019 to March 2020 in Riyadh City, Saudi Arabia. After obtaining ethical approval from the Institutional Review Board (IRB/E-2020), King Saud University, the study participants were virtually invited to participate in the study. The study inclusion criteria included menopausal women aged 46-65 years, who voluntarily agreed to participate in this research and could understand the questions to answer them. Women with a chronic illness who refrained from physical activity or currently under medication for any psychological illnesses were excluded from the study. All study participants were screened for the inclusion criteria. Moreover, the sociodemographic characteristics of the study participants were noted. Additionally, the study participants were requested to complete an online battery questionnaire, consisting of the following: the International Physical Activity Questionnaire- Short Form (IPAQ-SF), Fatigue Severity Scale (FSS), Beck Depression Inventory-II (BDI-II), and Insomnia Severity Index (ISI). All the respondents provided written informed consent forms and were requested to contact the researcher involved in the data collection if required.

The research participants were recruited via social media advertising, using platforms such as Snap Chat, Twitter, WhatsApp, and Facebook; however, the study sample was restricted to women aged 45-65 years. The survey included questions about women's age and history of the menstrual period (present, irregular, or absent). Then, each research participant received an online link that included 4 Questionnaires, as follows: The IPAQ-SF to assess physical activity level [Metabolic equivalents of Task (MET)], the FSS to measure the severity of fatigue, the BDI-II to assess depression, and the ISI to assess insomnia. The study sample was divided into physically active (>600 MET-minutes/week) and inactive groups (<600 MET-minutes/week) based on the physical activity level. There was no difference in age, area of residence, and educational level between the research groups.

The IPAQ-SF (Arabic version) assessed leisure-time PA, including DLAs and sitting time. It assesses active individuals in the past 7 days and found it a helpful tool [13]. Walking, moderate-intensity activities and vigorous-intensity activities are specific types of assessed activities. The frequency was measured in days per week, and duration was examined as time spent per day. They are separately measured per domain. PA was divided into categorical scores in this study; physically-inactive and physically-active groups [14].

The FSS is a self-report questionnaire to evaluate the severity of fatigue in various disorders. We used FSS-Ar (Arabic version) to explore fatigue, i.e., considered a valid and reliable tool for fatigue assessment in the Arabic population [15]. It includes 9 items, scored on a Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The average score of all items ranges between 1 (minimum) and 7 (maximum). The cut-off Mean $\pm$ SD values for healthy individuals equals 2.3 $\pm$ 0.7, and a score of  $\geq$ 4 is indicative of fatigue [16].

We used the BDI-II questionnaire (Arabic version) to assess the symptoms of depression. Moreover, it consists of 21 items, i.e., scored from 0 to 3. A higher score indicates severe depression [17]. It is a valid measure to assess the depression severity among the Arabic population [18].

The ISI (Arabic version) investigated any sleep disturbance symptoms with 7 domains, scored from 0 to 4, with scores ranging from 0 to 28; the higher the scores, the greater the sleep disturbance. The modified ISI Arabic version is a valid and reliable measure of insomnia and is widely used in the Arabic population [19].

The obtained data were analyzed using SPSS. The between-group differences were analyzed using an Independent Samples t-test. The association between physical activity and menopausal symptoms (insomnia, depression, fatigue) was analyzed using Pearson's correlation coefficient.

## 3. Results

After excluding the incomplete data from a sample of 104, 60 subjects were included for the final data analysis. Based on the study participant's level of physical activity, they were grouped as physically active and physically inactive. Each research group consisted of 30 participants. Furthermore, the Mean $\pm$ SD age of the active and inactive groups was 52.8 $\pm$ 4.0 and 53.3 $\pm$ 4.39 years, respectively. No significant difference was observed

**Table 1.** Clinical characteristics of the study participants (N=60)

Variables		Physically-Active Group (n=30)	Physically-Inactive Group (n=30)	P
Age (y), Mean±SD		52.8±4.0	53.3±4.39	0.60
Area of residence	Central region	21	22	0.52
	Other parts of Riyadh	09	08	
Educational level	Below high school	16	18	0.32
	High school and above	14	12	
Level of PA (MET-min/week)	Min-Max	700-1490	340-590	0.0001*
	Mean±SD	1228.1±34.7	503.4±13.1	
Fatigue	No (n=22)	16 (72.7)	6 (27.2)	0.0001*
	Yes (n=38)	14 (36.8)	24 (63.1)	
	Min-Max	7-54	18-63	
	Mean±SD	34.4±3.2	48.9±2.3	
Depression	0-10 (no depression) (n=21)	16 (76.1)	5 (23.9)	0.0001*
	11-16 (mild depression) (n=8)	6 (75)	2 (25)	
	17-20 (borderline depression) (n=7)	3 (42.8)	4 (57.1)	
	21-30 (moderate depression) (n=16)	4 (25)	12 (75)	
	31-40 (severe depression) (n=8)	1 (12.5)	7 (87.5)	
	Min-Max	2-16	17-39	
	Mean±SD	8.7±0.7	27.8±1.2	
Insomnia	0-7 (no insomnia) (n=16)	10 (62.5)	6 (37.5)	0.0001*
	8-14 (sub threshold insomnia) (n=26)	15 (57.6)	11 (42.3)	
	15-21 (moderate insomnia) (n=12)	4 (33.3)	8 (66.6)	
	22-28 (severe insomnia) (n=6)	1 (16.6)	5 (83.3)	
	Min-Max	4-27	5-28	
	Mean±SD	11.0±0.98	14.9±1.2	

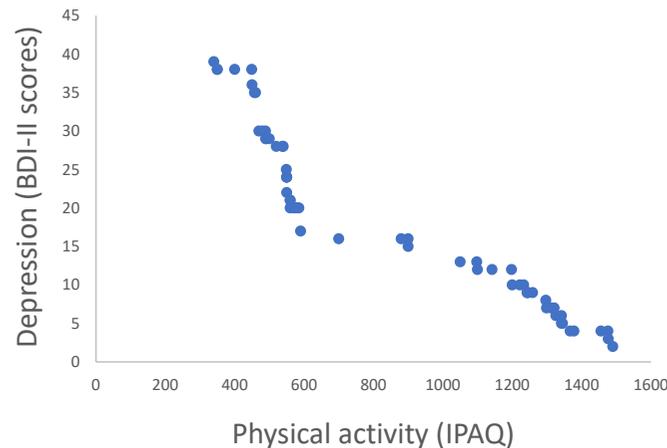
\*P≤0.05.

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Pearson correlation coefficient data revealed that PA was negatively associated with depression ( $r=-0.9$ ;  $P\leq 0.05$ ) (Figure 1), insomnia ( $r=-0.6$ ;  $P\leq 0.05$ ) (Figure 2), and fatigue ( $r=-0.65$ ;  $P\leq 0.05$ ) (Figure 3).

in the age range between the study groups. More than 60% of the inactive group participants presented fatigue, while 72.7% of the active participants reported no fatigue. In total, 8 participants reported severe depression on the BDI-II, out of which, 7(87.5%) subjects belonged to the inactive group.

Similarly, 6 of the explored menopausal women reported severe insomnia on the ISI; of whom, 5(83.3%) were in the physically inactive group. A significant difference was observed in fatigue, depression, and insomnia between the study groups ( $P\leq 0.05$ ) (Table 1).



**Figure 1.** Association between physical activity and depression in the study participants

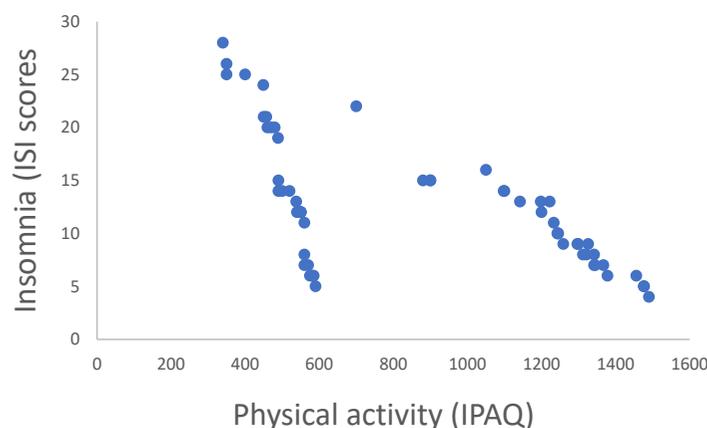
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#### 4. Discussion

The current study investigated the relationship between PA and menopausal symptoms, including fatigue, depression, and insomnia in women living in Riyadh. Half of the explored menopausal women were physically active. Besides, there was a significant relationship in the study variables between the study groups. This cross-sectional study signified that PA positively impacted menopausal symptoms (fatigue, insomnia, depression). Moreover, and the collected results highlighted the importance of PA among menopausal women.

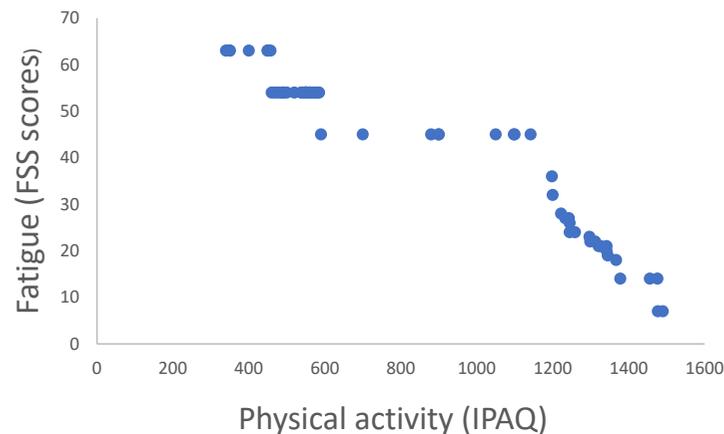
The study participants who obtained a score  $>4$  on the fatigue scale were considered as experiencing fatigue. We found that fatigue was higher among physically inactive women. This finding was consistent with another study (2017), which examined the prevalence of menopausal symptoms, its effect on the QoL, and perception on obtaining treatment in a multiracial community of

postmenopausal women in Klang Valley, Malaysia. The relevant data obtained by face-to-face interviews suggested that fatigue (59.3%) was a commonly reported symptom in menopausal women; 73.3% of the examined women reported joint and muscular discomfort [20]. We also found a significant relationship between PA and such menopausal symptoms as, depression and insomnia. This result was in line with those of a similar study that included 370 Brazilian menopause women aged 40-65 years. The study indicated that menopausal symptoms were less observed in middle-aged women who exercised. There was a significant difference in menopausal symptoms between the groups with different physical activity levels [21]. Another cross-sectional study also demonstrated similar physical activity and anxiety results in menopausal women assessed using the Goldenberg's questionnaire and the IPAQ. The authors argued that physical activity positively influenced physical health, social functioning, anxiety, and depression in menopausal women [22].



**Figure 2.** Association between physical activity and insomnia in the study subjects

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**Figure 3.** Association between physical activity and fatigue in the study sample

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A woman in the menopausal period is at high risk of developing a specific medical condition, as an associated complication, including cardiovascular disease, osteoporosis, urinary incontinence, weight gain, and sexual dysfunction due to vaginal dryness [7]. Previous research reported that the habitual practice of at least moderate-intensity PA for 60 minutes per day seems to beneficially affect menopausal symptoms and QoL, especially on psychosocial domains. The effects of habitual PA at the psychological level seem to be at least partially correlated with decreased menopausal symptoms and weight loss [23]. A randomized controlled trial on 164 women reported that walking and yoga enhance mood and positively affect the menopause-related QoL [24]. Another interventional study involving 248 post-menopausal sedentary women documented that aerobic exercises improved insomnia and depression in them; however, there was no significant improvement in sleep quality with exercise training [25].

Similar to our study findings, a cross-sectional cohort study among Taiwanese menopause women suggested the positive impact of PA on menopausal symptoms [21]. The literature on PA in menopausal women in Riyadh is scarce. Thus, our study may add value to the existing data. There were a few limitations worth mentioning in this study. The cross-sectional nature was the study's main limitation, as the cause and effect relationship between PA and menopausal symptoms, such as fatigue, depression, and insomnia could not be established. Second, our study included a small number of menopausal women living in Riyadh. This was because of two reasons; most Saudi women were unwilling to answer all the questions related to menopause due to social stigma, and lockdown due to COVID-19 refrained the authors from further continuing the study.

Furthermore, we conducted online sample recruitment and limited it to Riyadh; we also used self-report questionnaires which may have generated recall biases. Future studies with a large sample size involving menopausal women from different regions of the Saudi Kingdom and objective PA assessments to establish a strong relationship between PA and menopausal symptoms are highly recommended. This may help to develop interventions to effectively treat menopausal symptoms.

## 5. Conclusion

Physically active Saudi women presented less depression, insomnia, and fatigue, compared to their inactive counterparts. Healthcare professionals may help women reduce their menopausal symptoms by encouraging them to be physically active.

## Ethical Considerations

### Compliance with ethical guidelines

This study was approved by the Ethics Committee of the Institutional Review Board (IRB/E-2020), King Saud University.

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### Authors' contributions

Conceptualization, Methodology, and Investigation: Muneera Almurdi, Syamala Buragadda; Writing - review & editing: Muneera Almurdi, Syamala Buragadda;

Resources: Muneera Almurdi, Syamala Buragadda;  
Supervision: Muneera Almurdi, Syamala Buragadda.

### Conflict of interest

The authors have no conflict of interest to declare.

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