Impact of Physical Activity on General Health among Menopausal Women

Original Article

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ABSTRACT

Aim: This study evaluated the role of physical activity in boosting the general health of menopausal women.

Materials and Methods: This cross-sectional study was conducted at Suez-Canal University Hospital, Ismailia, Egypt. Hundred-ninety-one menopausal women were included. Their physical activity was assessed using the international physical activity questionnaire (IPAQ), whereas their general heath was evaluated through the 28-item general health questionnaire (GHQ). Data were analyzed using SPSS, and results were considered statistically significant at a *p-value* less than 0.05.

Results: The majority of the enrolled women had a low-to-intermediate level of physical activity, whereas the rest (24%) encountered a high physical level. We found a statistically significant difference in general health subscales between the low, intermediate and high physical levels ($p<0.001$). In particular, women with low physical activity had higher total GHQ scores compared to those with high physical activity had the lowest total GHQ scores. Moreover, women who were obese ($p<0.001$), diabetic ($p<0.001$) and/or hypertensive ($p<0.001$), complaining of vaginal dryness ($p=0.02$) and/or joint and muscular discomfort ($p<0.001$) had significantly higher total GHQ scores.

Conclusion: Physical activity of menopausal women is significantly associated with their general health, as less active women had poor general health.

Key Words: General health, menopause, physical activity

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INTRODUCTION

Menopause forms a large portion of every woman's life. In fact, women would spend one-third of their lives in menopause[1], and during these years, they could be struggling with several physical, vasomotor, psychological, and sexual symptoms[2]. Yet, the experience of menopause can vary widely from a woman to another, ranging from a smooth transition to a long tiring period of disturbances[3]. These variations were attributed to different factors, including the genes, lifestyle, diet, culture, and education[4]. Women encounter different levels of physical activity throughout their life based on their health status, body mass index (BMI), and socioeconomic status[1]. The impact of physical activity on people health has been receiving more attention recently[5]. Physical activity has been reported to lower the incidence of cardiovascular disease, obesity, osteoporosis, anxiety, depression, and even cancer[6]. More interestingly, studies have proposed that physical activity can relieve menopause-related symptoms and boost women's health status during this critical period[1,6].

Therefore, this study was conducted to evaluate the relation between physical activity of women in menopause and their general health.

PATIENTS AND METHODS

This cross-sectional study was conducted at Suez-Canal University (SCU) Hospital, Ismailia, Egypt, from May 2018 to October 2018. The Medical Ethical Committee of Faculty of Medicine, Suez-Canal University approved the study before commencement and informed consents were obtained from every enrolled woman. The study included 191 women between 45 to 70 years who had already reached their menopause. They were selected by convenience sampling method from different areas at Suez-Canal University Hospital, including inpatient wards and waiting areas in different clinics. Meanwhile, women who had an induced menopause, underwent simple hysterectomy, or refused to participate in this study were excluded.

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The data of every enrolled woman were obtained through a face-to-face interview. Within the interview, three questionnaires were filled in by the researcher; a basic questionnaire, the 28-item general health questionnaire (GHQ) and the international physical activity questionnaire (IPAQ). Afterwards, the woman's weight and height were assessed, and her BMI was calculated.

The basic questionnaire was used to obtain the demographic and clinical data such as the woman's age, residency, education, occupation, marital status, parity, duration of menopause, socioeconomic status (SES), monthly income, smoking status, use of hormonal replacement therapy, and the presence of chronic illnesses, psychological illnesses, vaginal dryness and/or joint and muscle pain. Meanwhile, the GHQ-28 was first developed in 1978 by Goldberg as a tool evaluating individual's risk of psychiatric disorders[7]. It consists of 28 items divided into four subscales; somatic symptoms, anxiety/insomnia, social dysfunction, and severe depression, each subscale contains 7 items and every item is assessed using four-point Likert scale (0-3). A score <7 indicates the health status of the person in that dimension and scores >7 suggests the presence of a disorder in the relevant dimension. The score obtained by any person ranges from 0 to 84.

The IPAQ was first developed in 1996 as a self-reported questionnaire to assess the physical activity among adults across different populations. The questionnaire is divided into five subscales, including physical activity related to job, transportation, house maintenance and caring for family recreation, sport and leisure time and time spent sitting[8]. Questions about physical activity were calculated based on the metabolic equivalent of the task (MET). Then, the level of physical activity was classified at three levels: low (lack of physical activity), moderate (MET-min 600-1500 per week), and high (MET-min over 1500 per week). Finally, BMI was calculated and classified according to the WHO classification index[9]. Height was measured while the women was in a standing position, bared foot with her head directed forward and the lower borders of the orbits at the same horizontal plane as the external auditory meatus. Meanwhile, the weight of the patient was measured while she was wearing light clothes. Also, the average weight of clothes customarily worn was determined and subsequently subtracted from the weight of patients. Weight and height were rounded to the nearest 0.5 Kg and 0.5 cm, respectively.

STATISTICAL ANALYSIS:

Data were analyzed using IBM Statistical Package for Social Sciences software (SPSS), 20th version. Continuous data were presented as mean ± standard deviation and categorical data as frequencies and percentages. One-way ANOVA was used to compare between quantitative data, while Chi-square was used to compare between the qualitative data, whenever compatible. Pearson's correlation coefficient was used to determine the correlations. The results were considered statistically significant at a *p-value* less than 0.05 and highly significant at *p-value* less than 0.01.

RESULTS

The demographic characteristics of the enrolled women are respresented in this study (Table 1). Their mean age was 56 ± 60 years. About half of the women were older than 55 years of age (50.8%) and/or living at a rural region (48.7%). Regarding their educational level, almost 20% were illiterate and only 3.1% had received higher education. The majority of them were married (81.2%), housewives (691%), of low SES (66.5%) and earned less than 2000 L.E. per month (75.9%). Approximately, half of the enrolled women were overweight (Table 2). Only 2.1% were smokers and 3.1% were on hormonal replacement therapy (HRT). On the other hand, 23% of the participants had chronic illnesses; most commonly diabetes (19.9%), followed by hypertension (14.7%) and heart disease (7.9%). Almost all of the women reported having a psychological illness and the majority (81.2%) complained of vaginal dryness and joint and muscular discomfort.

According to the International Physical Activity Questionnaire (IPAQ), the majority of the enrolled women had a low-to-intermediate level of physical activity, whereas the rest (24%) had high physical score (Figure 1).

Physical activity level was significantly associated with participants' age (*p<0.001*), residency (*p<0.001*), education (*p<0.001*), occupation (*p=0.03*), marital status (*p=0.03*), parity (*p=0.001*), duration of menopause (*p<0.001*) and socioeconomic level (*p<0.001*). To clarify, women with low physical activity were predominantly older, living in urban regions, had primary education, housewives, married or divorced, either nulliparous or high-multiparous, and of low SES (Table 3). Moreover, it was found that physical activity level was significantly associated with BMI (*p<0.001*), chronic illnesses as diabetes, hypertension, and heart disease (*p<0.001*), vaginal dryness (*p<0.001*) and joint and muscular pain (*p<0.001*). Women with low physical activity were obese, had diabetes, hypertension and/or heart disease and complained of vaginal dryness and/or joint and muscular pain. Meanwhile, smoking (*p=0.35*), HRT (*p=0.89*), and psychological illnesses (*p=0.46*) were not significantly related to the level of physical activity (Table 4).

Women's GHQ-28 scores are summarized in Table 5. Overall, the mean total score of GHQ-28 was 27.39 ± 12.47 with the highest score observed for the somatic symptoms (7.94 ± 3.78) and the lowest for severe depression symptoms (5.00 ± 3.01). Older women ($p<0.001$), living in urban regions ($p<0.001$), had only primary education ($p=0.02$), high multiparous ($p=0.01$), or of low socioeconomic status ($p=0.002$) had significantly higher total GHQ scores (Table 6).

Although occupation was insignificantly associated with the total GHQ score, housewives had had higher score in social dysfunction subscale ($p=0.02$).

Regarding the association between the clinical characteristics of the enrolled women and GHQ-28, it was found that women who were obese ($p<0.001$), diabetic ($p<0.001$) and/or hypertensive ($p<0.001$), complaining of vaginal dryness ($p=0.02$) and/or joint and muscular discomfort ($p<0.001$) had significantly higher total GHQ scores (Table 7).

Although occupation was insignificantly associated with the total GHQ score, housewives had had higher score in social dysfunction subscale ($p=0.02$). Yet, those suffering of vaginal dryness had significantly higher scores in social dysfunction only and not the other subscales ($p=0.01$). Moreover, it was found that age, duration of menopause and BMI had positive significant correlations with all subscales of GHQ-28 ($p<0.001$) (Table 8).

GHQ-28 scores were significantly associated with women's physical activity ($p<0.001$), as women with low physical activity had higher total GHQ score, whereas women with high physical activity had the lowest total score (Table 9).

Using multivariable linear regression analysis, the best-fitting predictors for the GHQ-28 were residency ($p=0.019$) and low physical activity ($p<0.001$), as there is an increase by 0.14 point in GHQ-28 score of women living in urban areas compared to those living in rural ones.

Meanwhile, there is an increase by 0.42 point in GHQ-28 score for females with low physical activity vs. other females in different levels of physical activity (Table 10).

Table 1: Socio-demographic characteristics of the studied sample (n=191)

Characteristics	N (%)
Age, mean ± SD	56.05 ± 6.09
Age groups, n (%)	
≤ 50 year	46 (24.1)
51-55 year	48 (25.1)
56-60 year	47 (24.6)
> 61 year	50 (26.2)
Residency	
Urban	98 (51.3)
Rural	93 (48.7)
Education, n (%)	
Illiterate	38 (19.9)
Primary	29 (15.2)
Preparatory	52 (27.2)
Secondary	66 (34.6)
University	6 (3.1)
Occupation, n (%)	
Housewife	132 (69.1)
Employed	59 (30.9)
Marital status, n (%)	
Single	5 (2.6)
Married	155 (81.2)
Divorced	11 (5.8)
Widow	20 (10.5)
Parity, n (%)	
None	6 (3.1)
1 – 3	110 (57.6)
4 – 6	75 (39.3)
Duration of menopause, mean ± SD	7.5 ± 5.7
Socioeconomic level, n (%)	
Low	37 (19.4)
Intermediate	127 (66.5)
High	27 (14.1)
Monthly income, n (%)	
1000: 2000 L. E	23 (12)
2000: 3000 L. E	122 (63.9)
>3000 L. E	46 (24.1)

Data are described as N (%) or mean ± SD as required
SD: standard deviation; L.E.: Egyptian pound

Table 2: Clinical characteristics of the studied sample

Characteristics	N (%)
BMI, mean ± SD	27.6 ± 3.6
BMI groups, n (%)	
Normal	45 (23.6)
Overweight	96 (50.3)
Obese	50 (26.2)
Smoking status, n (%)	
Non-smoker	187 (97.9)
Smoker	4 (2.1)
Hormonal replacement therapy, n (%)	
Absent	185 (96.9)
Present	6 (3.1)
Chronic disease, n (%)	
Absent	147 (77)
Present	44 (23)
Diabetes Mellitus	38 (19.9)
Hypertension	28 (14.7)
Heart disease	15 (7.9)
Psychological illness, n (%)	
Absent	186 (97.4)
Present	5 (2.6)
Vaginal dryness, n (%)	
Absent	36 (18.8)
Present	155 (81.2)
Joint and muscular discomfort, n (%)	
Absent	36 (18.8)
Present	155 (81.2)

Data are described as N (%) or mean ± SD as required
SD: standard deviation; BMI: body mass index

Table 3 : Comparison between socio-demographic characteristics and physical activity

Characteristics	Physical activity			*p-value*
	Low (n=45)	Intermediate (n=111)	High (n=35)	
Age groups				
≤ 50 year	2 (4.3)	27 (58.7)	17 (37)	<0.001a
51-55 year	5 (10.4)	31 (64.6)	12 (25)	
56-60 year	10 (21.3)	36 (76.6)	1 (2.1)	
> 61 year	28 (56)	17 (34)	5 (10)	
Residency				
Urban	38 (38.8)	54 (55.1)	6 (6.1)	<0.001a
Rural	7 (7.5)	57 (61.3)	29 (31.2)	
Education				
Illiterate	11 (28.9)	20 (52.6)	7 (18.4)	<0.001a
Primary	17 (58.6)	9 (31)	3 (10.3)	
Preparatory	9 (17.3)	33 (63.5)	10 (19.2)	
Secondary	7 (10.6)	47 (71.2)	12 (18.2)	
University	1 (16.7)	2 (33.3)	3 (50)	
Occupation				
Housewife	38 (28.8)	71 (53.8)	23 (17.4)	0.03a
Employed	7 (11.9)	40 (67.8)	12 (20.3)	
Marital status				
Single	2 (40)	1 (20)	2 (40)	0.03a
Married	31 (20)	97 (62.6)	27 (17.4)	
Divorced	5 (45.5)	2 (18.2)	4 (36.4)	
Widow	7 (35)	11 (55)	2 (10)	
Parity				
None	2 (33.3)	1 (16.7)	3 (50)	0.001a
1 – 3	15 (13.6)	75 (68.2)	20 (18.2)	
4 – 6	28 (37.3)	35 (46.7)	12 (16)	
Duration of menopause, mean ± SD	12.7±5.3	6.4±5.0	4±4.2	<0.001b
Socioeconomic level				
Low	17 (45.9)	18 (48.6)	2 (5.4)	<0.001a
Intermediate	22 (17.3)	83 (65.4)	22 (17.3)	
High	6 (22.2)	10 (37)	11 (40.7)	
Monthly income				
1000: 2000 L. E	7 (30.3)	13 (56.4)	3 (13)	0.14 a
2000: 3000 L. E	23 (18.9)	78 (63.9)	21 (17.2)	
>3000 L. E	15 (32.6)	20 (43.5)	11 (23.9)	

a p-values are based on Chi square test. Statistical significance at $P < 0.05$
b p-values are based on One-Way ANOVA test. Statistical significance at $P < 0.05$
SD: standard deviation; L.E.: Egyptian pound

Table 4 : Comparison Clinical characteristics and physical activity

Characteristics	physical activity			*p-value*
	Low (n=45)	Intermediate (n=111)	High (n=35)	
BMI, mean ± SD	31.7 ± 2.8	26.4 ± 2.6	26.1 ± 3.5	<0.001a
BMI groups				
Normal	1 (2.2)	31 (68.9)	13 (28.9)	
Overweight	3 (3.1)	73 (76)	20 (20.8)	<0.001b
Obese	41 (82)	7 (14)	2 (4)	
Smoking status				
Non-smoker	43 (23)	110 (58.8)	34 (18.2)	0.35b
Smoker	2 (50)	1 (25)	1 (25)	
Hormonal replacement therapy				
Absent	44 (23.8)	107 (57.8)	34 (18.4)	0.89b
Present	1 (16.7)	4 (66.7)	1 (16.6)	
Diabetes Mellitus				
Absent	15 (9.8)	106 (69.3)	32 (20.9)	<0.001b
Present	30 (78.9)	5 (13.2)	3 (7.9)	
Hypertension				
Absent	27 (16.6)	102 (62.6)	34 (20.8)	<0.001b
Present	18 (64.3)	9 (32.1)	1 (3.6)	
Heart disease				
Absent	38 (21.6)	103 (58.5)	35 (19.9)	0.03b
Present	7 (46.7)	8 (53.3)	0 (0)	
Psychological illness				
Absent	43 (23.1)	108 (58.1)	35 (18.8)	0.46b
Present	2 (40)	3 (60)	0 (0)	
Vaginal dryness				
Absent	2 (5.6)	20 (55.6)	14 (38.9)	<0.001b
Present	43 (27.7)	91 (58.8)	21 (13.5)	
Joint and muscular discomfort				
Absent	0 (0)	5 (13.9)	31 (86.1)	<0.001b
Present	45 (29)	106 (68.4)	4 (2.6)	

a p-values are based on One-Way ANOVA test. Statistical significance at $P < 0.05$
b p-values are based on Chi square test. Statistical significance at $P < 0.05$
SD: standard deviation; BMI: body mass index

Table 5 : Descriptive statistics of general health questionnaire (GHQ-28)

General health	mean ± SD
Somatic symptoms	7.94 ± 3.78
Been feeling perfectly well and in good health	1.13 ± 0.78
Been feeling in need of a good tonic	1.21 ± 0.70
Been feeling run down and out of sorts	1.16 ± 0.76
Felt that you are ill	1.12 ± 0.72
Been getting any pains in your head	1.12 ± 0.74
Been getting a feeling of tightness or pressure in your head	1.08 ± 0.82
Been having hot or cold spells	1.12 ± 0.74
Anxiety/Insomnia symptoms	7.04 ± 3.49
Lost much sleep over worry	1.01 ± 0.75
Had difficulty in staying asleep once you are off	1.09 ± 0.75
Felt constantly under strain	1.02 ± 0.79
Been getting edgy and bad-tempered	1.03 ± 0.78
Been getting scared or panicky for no good reason	0.98 ± 0.63
Found everything getting on top of you	1.01 ± 0.73
Been feeling nervous and strung-up all the time	0.91 ± 0.77
Social dysfunction symptoms	7.41 ± 3.44
Been managing to keep yourself busy and occupied	1.17 ± 0.66
Been taking longer over the things you do	1.04 ± 0.74
Felt on the whole you were doing things well	1.05 ± 0.73
Been satisfied with the way you've carried out your task	1.07 ± 0.67
Felt that you are playing a useful part in things	1.06 ± 0.72
Felt capable of making decisions about things	0.98 ± 0.69
Been able to enjoy your normal day-to-day activities	1.03 ± 0.77
Severe depression symptoms	5.00 ± 3.01
Been thinking of yourself as a worthless person	0.98 ± 0.67
Felt that life is entirely hopeless	0.94 ± 0.70
Felt that life isn't worth living	0.87 ± 0.70
Thought of the possibility that you might make away with yourself	0.66 ± 0.63
Found at times you couldn't do anything because your nerves were too bad	0.64 ± 0.62
Found yourself wishing you were dead and away from it all	0.51 ± 0.61
Found that the idea of taking your own life kept coming into your mind	0.38 ± 0.60
Total general health questionnaire (GHQ-28)	27.39 ± 12.47

Table 6: Comparison between socio-demographic characteristics and general health questionnaire subscales

Characteristics	General health questionnaire subscales, (mean ± SD)				
	Somatic	Anxiety/ insomnia	Social dysfunction	Severe depression	Total
Age groups					
≤ 50 year	6.3 ± 3.5	5.5 ± 3.1	5.7 ± 3.2	3.8 ± 3.0	21.2 ± 11.5
51-55 year	7.4 ± 3.8	6.6 ± 3.8	7.1 ± 3.2	4.3 ± 2.6	25.5 ± 12.3
56-60 year	8.0 ± 3.5	6.9 ± 3.2	7.5 ± 3.1	5.1 ± 2.9	27.5 ± 11.5
> 61 year	10.0 ± 3.3	9.0 ± 2.7	9.1 ± 3.3	6.5 ± 2.8	34.6 ± 10.8
p-value	<0.001 a	<0.001 a	<0.001 a	<0.001 a	<0.001 a
Residency					
Urban	9.3 ± 3.8	8.4 ± 3.3	8.6 ± 3.7	6.0 ± 3.3	32.3 ± 13.0
Rural	6.4 ±3.0	5.6 ± 3.0	6.1± 2.6	4.0 ± 2.2	22.2 ± 9.6
p-value	<0.001 a	<0.001 a	<0.001 a	<0.001 a	<0.001 a
Education					
Illiterate	8.3 ± 3.6	8.2 ± 3.0	8.1 ± 3.0	5.3 ± 2.6	30.0 ± 10.7
Primary	9.5 ± 3.4	8.3 ± 3.5	9.1 ± 3.5	6.1 ± 3.7	33.1 ± 13.0
Preparatory	7.5 ± 3.8	6.3 ± 3.5	6.6 ± 3.4	4.9 ± 3.0	25.3 ± 12.4
Secondary	7.4 ± 3.8	6.4 ± 3.4	7.0 ± 3.4	4.5 ± 2.8	25.3 ± 12.4
University	7.3 ± 3.0	5.8 ± 3.0	6.1 ± 3.4	4.0 ± 2.3	23.3 ± 12.4
p-value	0.12 a	0.007 a	0.008 a	0.12 a	0.02 a
Occupation					
Housewife	8.2 ± 3.8	7.3 ± 3.4	7.8 ± 3.4	5.3 ± 3.2	28.6 ± 12.6
Employed	7.2 ± 3.7	6.5 ±3.6	6.5 ± 3.3	4.3 ± 2.4	24.7 ± 11.8
p-value	0.11 a	0.16 a	0.02 a	0.059 a	0.058 a
Marital status					
Single	8.4 ± 5.5	8.4 ± 5.5	7.8 ± 2.1	6.2 ± 2.6	30.8 ± 14.4
Married	7.9 ± 3.7	7.0 ± 3.4	7.2 ± 3.5	4.8 ± 3.0	27.0 ± 12.4
Divorced	7.9 ± 4.4	7.5 ± 3.7	8.3 ± 4.7	5.6 ± 3.6	29.3 ± 15.8
Widow	8.2 ± 3.2	7.3 ± 3.7	8.2 ± 2.8	5.4 ± 2.6	29.2 ± 11.3
p-value	0.98 a	0.75 a	0.50 a	0.58 a	0.74 a
Parity					
None	7.6 ± 3.6	8.5 ± 5.6	7.6 ± 3.3	6.5 ± 2.4	30.3 ± 11.4
1 – 3	7.3 ± 3.6	6.5 ± 3.2	6.8 ± 3.0	4.5 ± 2.6	25.1 ± 11.0
4 – 6	8.8 ± 3.9	7.7 ± 3.6	8.2 ± 4.0	5.6 ± 3.4	30.4 ± 13.8
p-value	0.04 a	0.03 a	0.02 a	0.01 a	0.01 a
Socioeconomic level					
Low	9.4 ± 3.8	8.2 ± 3.5	8.7 ± 3.6	6.4 ± 3.6	32.7 ± 13.6
Intermediate	7.9 ± 3.6	7.0 ± 3.4	7.3 ± 3.2	4.8 ± 2.6	27 ± 11.5
High	6.2 ± 3.7	5.7 ± 3.5	6.1 ± 3.6	3.7 ± 3.0	22.0 ± 12.8
p-value	0.004 a	0.01 a	0.009 a	0.002 a	0.002 a
Monthly income					
1000: 2000 L. E	8.0 ± 3.4	7.6 ± 2.7	7.8 ± 2.7	6.0 ± 2.2	29.5 ± 9.7
2000: 3000 L. E	7.9 ± 3.6	6.8 ± 3.4	7.3 ± 3.2	5.0 ± 3.0	27.0 ± 12.0
>3000 L. E	8.2 ± 3.4	7.3 ± 4.0	7.4 ± 4.1	4.5 ± 3.1	27.5 ± 14.8
p-value	0.83 a	0.49 a	0.79 a	0.16 a	0.66 a

a p-values are based on One-Way ANOVA test. Statistical significance at $P < 0.05$
SD: standard deviation; L.E.: Egyptian pound

Table 7: Comparison between clinical characteristics and general health questionnaire subscales

Characteristics	General health questionnaire subscales				
	Somatic	Anxiety/ insomnia	Social dysfunction	Severe depression	Total
BMI groups					
Normal	6.4 ± 3.4	5.32 ± 3.3	5.72 ± 3.0	4.12 ± 3.0	21.52 ± 11.6
Overweight	6.8 ± 3.0	6.12 ± 2.7	6.52 ± 2.7	4.22 ± 2.6	23.72 ± 9.5
Obese	11.5 ± 3.0	10.22 ± 2.7	10.52 ± 3.0	7.32 ± 2.4	39.6 ± 9.92
p-value	<0.001a	<0.001 a	<0.001 a	<0.001 a	<0.001 a
Smoking status					
Non-smoker	8.02 ± 3.8	7.02 ± 3.5	7.42 ± 3.5	5.02 ± 3.0	27.42 ± 12.5
Smoker	7.52 ± 3.4	6.02 ±2.1	7.52 ± 2.0	4.72 ± 3.1	25.72 ± 9.2
p-value	0.81 a	0.54 a	0.96 a	0.86 a	0.79 a
Hormonal replacement therapy					
Absent	8.02 ± 3.8	7.12 ± 3.5	7.42 ± 3.4	5.02 ± 3.0	27.52 ± 12.5
Present	7.52 ± 3.2	5.82 ± 3.0	6.32 ± 3.1	3.82 ± 2.6	23.52 ± 11.2
p-value	0.77 a	0.39 a	0.43 a	0.33 a	0.43 a
Diabetes Mellitus					
Absent	7.22 ± 3.4	6.32 ± 3.1	6.62 ± 3.0	4.32 ± 2.6	24.62 ± 11.0
Present	10.82 ± 3.7	9.82 ± 3.4	10.32 ± 3.4	7.52 ± 3.0	38.52 ± 12.0
p-value	<0.001 a	<0.001 a	<0.001 a	<0.001 a	<0.001 a
Hypertension					
Absent	7.52 ± 3.5	6.72 ± 3.3	7.02 ± 3.2	4.72 ± 3.0	26.02 ± 11.9
Present	10.22 ± 4.2	9.12 ± 3.9	9.62 ± 3.8	6.52 ± 2.5	35.52 ± 12.8
p-value	<0.001 a	0.001 a	<0.001 a	0.003 a	<0.001 a
Heart disease					
Absent	7.82 ± 3.7	7.02 ± 3.4	7.22 ± 3.3	5.02 ± 3.0	27.02 ± 12.3
Present	8.82 ± 4.3	7.42 ± 3.8	9.02 ± 4.5	5.82 ± 3.0	31.02 ± 14.0
p-value	0.35 a	0.62 a	0.07 a	0.24 a	0.23 a
Psychological illness					
Absent	7.92 ± 3.7	7.02 ± 3.4	7.42 ± 3.4	5.02 ± 3.0	27.22 ± 12.4
Present	10.02 ± 4.9	8.02 ± 4.2	7.82 ± 3.5	5.62 ± 3.0	31.42 ± 14.0
p-value	0.21 a	0.53 a	0.80 a	0.65 a	0.46 a
Vaginal dryness					
Absent	7.02 ± 3.7	6.02 ± 3.5	6.12 ± 3.1	4.12 ± 2.2	23.32 ± 11.4
Present	8.12 ± 3.7	7.22 ± 3.3	7.72 ± 3.4	5.12 ± 3.1	28.32 ± 12.5
p-value	0.09 a	0.052 a	0.01 a	0.06 a	0.02 a
Joint and muscular discomfort					
Absent	5.02 ± 2.6	4.12 ± 2.5	4.42 ± 1.8	2.62 ± 1.8	16.22 ± 7.0
Present	8.62 ± 3.6	7.72 ± 3.3	8.12 ± 3.3	5.52 ± 3.0	30.02 ± 12.0
p-value	<0.001 a	<0.001 a	<0.001 a	<0.001 a	<0.001 a

a p-values are based on One-Way ANOVA test. Statistical significance at $P < 0.05$
SD: standard deviation; BMI: body mass index

Table 8: Correlation between age, duration of menopause and BMI with General health questionnaire subscales

Variables	Somatic	Anxiety/ insomnia	Social dysfunction	Severe depression	Total
Age					
r	0.36	0.38	0.38	0.39	0.41
p-value	<0.001a	<0.001a	<0.001a	<0.001a	<0.001a
Duration of menopause					
r	0.38	0.40	0.39	0.41	0.43
p-value	<0.001a	<0.001a	<0.001a	<0.001a	<0.001a
BMI					
r	0.46	0.49	0.46	0.40	0.50
p-value	<0.001a	<0.001a	<0.001a	<0.001a	<0.001a

a P values are based Pearson's correlation coefficient. Statistical significance at $P < 0.05$
BMI: body mass index

Table 9 : Relationship between physical activity and general health subscales

Physical activity	General Health					P value
	Somatic	Anxiety/ insomnia	Social dysfunction	Severe depression	Total	
Low	12.1 ± 2.3	11.0 ± 2.0	11.3 ± 2.5	7.9 ± 2.5	42.3 ± 7.6	< 0.001a
Intermediate	7.2 ± 3.1	6.4 ± 2.9	6.9 ± 2.8	4.6 ± 2.6	25.0 ± 9.9	< 0.001 a
high	4.9 ± 2.5	4.3 ± 2.5	4.3 ± 1.7	2.7 ± 1.7	16.1 ± 6.7	< 0.001 a

a p-values are based on One-Way ANOVA test. Statistical significance at $P < 0.05$

Table 10: Multivariable linear regression analysis of determinants of general health questionnaire (GHQ-28)

Predictors	Unstandardized Coefficients		Standardized Coefficients Beta	Odds ratio (95% CI)	P value
	B	Std. Error			
(Constant)	58.746	44.963			0.193
Age	-1.022	0.949	-0.500	0.61 (-2.89 – 0.851)	0.283
Duration of menopause	1.235	1.002	0.571	1.77 (-0.743 – 3.212)	0.220
Residency					
Urban Vs rural (R)	3.606	1.519	0.145	1.16 (0.608 – 6.604)	0.019*
Education	-0.042	0.634	-0.004	1 (-1.29 – 1.21)	0.947
Parity	-0.179	0.713	-0.015	0.99 (-1.58 – 1.23)	0.802
Socioeconomic level±					
Intermediate	0.682	1.815	0.026	1.03 (-2.9 – 4.26)	0.708
High	-3.191	2.441	-0.089	0.91 (-8.01 – 1.63)	0.193
BMI	0.240	0.230	0.071	1.07 (-0.21 – 0.69)	0.298
DM	2.692	2.454	0.086	1.09 (-2.15 – 7.54)	0.274
HTN	-1.891	2.285	-0.054	0.95 (-6.4 – 2.18)	0.409
Vaginal dryness	-1.176	2.019	-0.037	0.96 (-5.16 – 2.81)	0.561
Joint muscular pain	4.247	3.091	0.134	1.14 (-1.85 – 10.35)	0.171
Physical activity±					
Low	12.530	2.581	0.427	1.53 (7.44 – 17.62)	< 0.001*
High	-3.624	3.185	-0.113	0.89 (-9.91 – 2.66)	0.257

ANOVA<0.001, R2=0.502
* Statistical significance at P < 0.05
±Excluded Variables: Moderate physical activity, low socioeconomic level; collinearity <0.001
BMI: body mass index; DM: diabetes mellitus; HTN: hypertension

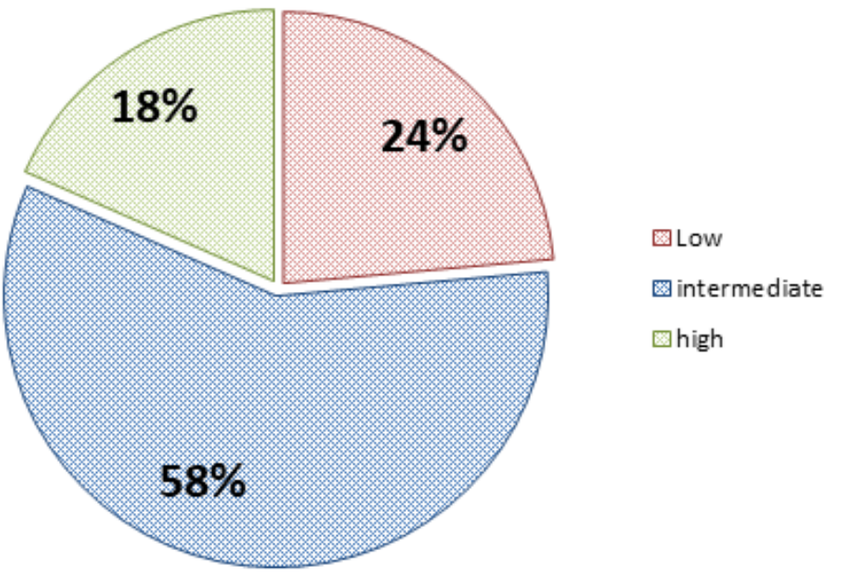

Fig.1: Physical activity levels according International Physical Activity Questionnaire (IPAQ)

DISCUSSION

Although menopause is a natural process in every woman's life; yet, it can be associated with several physical, psychological, and social problems and can negatively impact the quality of her life[10]. In this study, we evaluated the association between the physical activity of menopausal women and their general health as assessed by the GHQ-28. According to the IPAQ, the majority of the enrolled women had a low-to-intermediate level of physical activity.

This could be attributed to the fact that over half of these women were obese, of old age, and had psychological illnesses which have probably prevented them from doing regular exercise or at least having an active lifestyle. Moreover, physical activity level was significantly associated with women's age, residency, education, occupation, marital status, parity, duration of menopause, and socioeconomic level.

Additionally, it was also associated with their BMI, chronic illnesses as diabetes, hypertension, and heart disease, vaginal dryness, and joint and muscular pain. Meanwhile, smoking, HRT, and psychological illnesses were not significantly related to the level of physical activity. Nelson *et al.*[6] found that physical activity was significantly influenced by race, obesity, and marginally by smoking.

On the other hand, they didn't report such a significant association with education, marital status, parity, depressive symptoms, age, stress, or anxiety level at the baseline. Physical activity has been reported to have a role in preventing heart disease during menopause through regulating the blood pressure[1]. Moreover, many studies have reported that regular exercising is the most important step in controlling hypertension during menopause[11,12].

In the current study, it was found that women who were older, living in urban regions, of a primary level education, high multiparous, or of low socioeconomic status had significantly higher total GHQ scores. Although occupation was not significantly associated with the total GHQ score, housewives had a higher score in social dysfunction subscale.

A similar study by Sharifi *et al.*[1] showed a significant association between GHQ-28 and parity, occupation, and educational level. They indicated that individuals with higher parity had poor general health. They also indicated that employed women and those less educated had poor general health. Less educated women have been suggested to be at a higher risk of mental problems. Moreover, higher education is often associated with a higher income and greater job and social opportunities Some suggested that people with higher level of education would have easier access to information sources and healthcare services, and thus, better quality of life[13-15].

In addition, it was found that women who were obese, diabetic and/or hypertensive, complaining of vaginal dryness and/or joint and muscular discomfort had significantly higher total GHQ scores. But those suffering from vaginal dryness had significantly higher scores in social dysfunction only and not the other subscales. A study reported that women with vaginal dryness, even when they did not identify their symptom as bothersome, had worse mental as well as emotional well-being and social functioning[16].

Importantly, it was found that age, duration of menopause and BMI had positive significant correlations with all subscales of GHQ-28. Older and obese women are expected to have poor general health and more disturbing symptoms. This might be related to the lifestyle that these women encounter, which is probably a more sedentary and may be less socially active life.

In a study assessing the quality of menopausal women's lives, Ibrahim *et al.* indicated that older women were more susceptible to have poor quality of life[17]. Yet, Karmakar *et al*. reported that women ≤ 50 years had more severe psychological and physical symptoms[18]. It's been suggested that the negative impact of menopausal symptoms on the quality of life decreases in older women who may have learned to handle their menopause-related symptoms over time[3].

A statistically significant association between women's physical activity and their general health was found. In fact, the level of physical activity was found to be one of the significant predictors of GHQ-28 and women with low physical activity had higher total GHQ score; indicating poorer general health.

Several mechanisms were suggested to explain the observed association between physical activity and menopause-related physical and psychological symptoms, including increased aminergic synaptic transmission in the brain, improved self-efficacy, intensified endorphin secretion, and diversion from stressful stimuli[19].

In Sharifi[1] *et al.* study, those who had a moderate level of physical activity complained of less physical symptoms, had better general health, and were less anxious. Some even suggested that the quality of life in

menopausal women improved after a six-week exercise program[10]. Other showed that physical activity can boost self-respect in menopausal women[20].

The major limitation of this study was the recall bias, as answering the items of GHQ-28 depended on the women's recall of their symptoms during the previous month. Moreover, this was a cross-sectional study conducted in a single hospital and therefore, it doesn't necessarily represent the whole community.

CONCLUSION

In conclusion, this study demonstrated a significant association between physical activity of the menopausal women and their general health, as less active women were found to have poor general health. Future multi-centric, and thus more representative, studies are needed. Moreover, the government should work to increase women's awareness of this critical period of their lives and encourage them to embrace a more active lifestyle.

CONFLICT OF INTEREST

There are no conflicts of interests.

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