

# Physical activity profile among Saudi adults in Abha City, Saudi Arabia

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## Abstract

**Objective:** To describe the physical activity (PA) profile and its determinants among attendants of primary healthcare (PHC) centers in Abha City, Saudi Arabia.

**Subjects and methods:** A cross-sectional study design was followed to include 404 Saudi adults aged 19-65 years who attended PHC centers in Abha City. A self-administered questionnaire was designed by the researchers and was used for data collection. It consisted of three parts, i.e., personal characteristics, participants' PA assessment by the Arabic short form of the International Physical Activity Questionnaire (IPAQ), while the third part included inquiry about barriers against PA.

**Results:** Most participants (80%) reported low level of PA, whereas 17.1% reported moderate PA. High level of PA was reported among only 12 participants (3%). Vigorous physical activities were practiced by only 4% of participants, whereas moderate physical activities were practiced by only 3%, and walking was practiced by 49.8%. Regarding duration of sitting (minutes/day), 40.3% reported sitting periods more than 360 minutes/day. Moderate and high physical activities were more practiced by males than females (21.5% and 3.4% versus 12.6% and 2.5%, respectively,  $p=0.046$ ). Barriers to PA included unavailability of suitable places to exercise, being not sure of the ability to exercise efficiently, believing that exercise is hard work, and being embarrassed to exercise.

**Conclusions:** Most Saudi adults attending PHC centers in Abha City have low level of PA. Males have significantly higher PA than females. There are several barriers against PA. Overcoming these barriers will contribute to improvement in PA among the Saudi population.

**Key words:** Physical activity, IPAQ, Primary health care, Risk factors, Saudi Arabia.

## Introduction

Physical activity (PA) represents a wide range of body movements generated by the skeletal muscles and utilization of energy above the baseline level. It includes routine daily activities, exercise, and active sports (1). Exercise is an active repetitive form of PA that is designed to improve the body fitness (2). PA, particularly exercise, enhances health and well-being through improving bone quality, strengthening muscles, increasing the capacity of cardiovascular system, and reducing depression and anxiety (3, 4).

Scientific evidence has supported introducing exercise as the essential components of health promotion programs directed toward the general population (1). The American Heart Association (AHA) recommends “at least 150 minutes per week of moderate intensity aerobic activity or 75 minutes of vigorous activity for optimal health”(5).

In Saudi Arabia, studies showed low PA and a general tendency to sedentary life style, which leads to increasing rates of obesity, diabetes mellitus, and cardiovascular diseases (6-11). The cultural factors represent the main obstacle for adults to exercise and to sustain the physically active lifestyle, despite many health education campaigns having been conducted. A study found that only 15% of Saudi college males practice adequate PA to gain substantial health benefits(12).

The present study aimed to describe the physical activity profile and its determinants among attendants of primary healthcare centers in Abha City, Saudi Arabia.

## Subjects and Methods

Following a cross-sectional design, this study was conducted at primary health care (PHC) centers belonging to the Ministry of Health (MOH) in Abha City, Kingdom of Saudi Arabia (KSA). The target population of the present study were patients attending PHC centers since they constitute a more representative sample for the Saudi population than patients who attend general or specialized hospitals.

The inclusion criteria were being Saudi adult patients, aged 19-65 years, who attend governmental PHC centers in Abha City.

Using Epi-Info software (Version 7), and an estimated prevalence of physical activity of 54% (13), at 95% confidence level, and 5% estimated error, the minimum sample size for the present study was calculated to be 382 participants. However, the sample size was increased to 404 participants to compensate for any possible missing data.

Data collection was performed during January – May, 2019. Two PHC centers were selected by a simple random method technique. A systematic sampling technique was followed to select patients from a waiting list in the selected

PHC centers. As patient frequency was about 25 patients per day for each center, 5 patients were selected daily from each PHC center (i.e., every fifth patient).

Based on thorough review of relevant literature, a self-administered questionnaire was designed by the researchers and was used for data collection. It consisted of three parts, as follows:

**1- Socio-demographic characteristics of participants:** Age, gender, marital status, educational level, job, smoking history, history of chronic diseases. Participants' weight and height measurements were assessed by trained nurses. Body mass index (BMI) was calculated and classified into: Underweight (BMI <18.5 kg/m<sup>2</sup>), Normal (BMI 18.5–24.9 kg/ m<sup>2</sup>), Overweight (BMI 25–29.9 kg/ m<sup>2</sup>), or Obese (BMI ≥ 30 kg/m<sup>2</sup>).

**2- The Short Form of the International Physical Activity Questionnaire (IPAQ) (14).**

The IPAQ short version estimates how much health enhancing physical activity, including daily life activities and exercise, the person has undertaken over the previous 7 days. The reliability and validity of the questionnaire was tested across 12 countries(15). The findings suggest that it is an acceptable tool for use in many settings and in different languages, and is suitable for use in regional, national and international monitoring and surveillance system and for use in research projects and public health program planning and evaluation (16).

The IPAQ included questions about PA of 3 intensities (i.e., vigorous physical activity, moderate physical activity, and walking). The physicians had to estimate how many days (frequency) he/she was physically active and the average time (duration) that he/she spent being physically active on these days. We calculated the total physical activity, MET or metabolic equivalent (MET min/week), as suggested in the Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire for the sum of walking, and moderate, and vigorous physical activity(17).

The tool asks for times that the individual spent in walking, moderate- and vigorous-intensity physical activities. The volume of activity can be computed by weighting each type of activity by its energy requirements (METs). METs are multiples of resting metabolic rate and a MET- minute is computed by multiplying the MET score of activity by the minutes performed (14). Metabolic equivalent (MET) is a unit used to estimate the metabolic cost (oxygen consumption) of physical activity. One MET equals the resting metabolic rate of approximately 1 kcal/kg/h. MET-minutes is the rate of energy expenditure expressed as METs per minute multiplied by minutes of a specific activity (18).

Using the Ainsworth et al. compendium of the average MET score for each type of activity, the following values were used for the analysis of IPAQ data (19):

- walking at work = 3.3 METs,
- cycling for transportation = 6.0 METs,

- moderate yard work = 4.0 METs,
- vigorous intensity in leisure = 8.0 METs

IPAQ classifies the subjects to three categorical (ordinal) levels based on intensity, duration and the frequency of the physical activity (15).

**3-** Barriers for being physically active (12 items) as well as reasons for being physically active (7 items). Respondents who had low PA were asked to mention the barriers for being physically active. A 5-Likert scale ranging from strongly agree "1" to strongly disagree "5" was used in this part.

The statistical Package for Social Sciences (IBM, SPSS version 25) was used for data entry and analysis. Descriptive statistics (e.g., frequency, percentage, mean, range, standard deviation) and analytic statistics using chi-square test were applied. P-values <0.05 were considered as statistically significant.

The researchers fulfilled all the required official approvals prior to study conduction. Verbal consent to participate in the study was asked from each participant. All participants had the right not to participate in the study or to withdraw from it prior to completion. The researcher explained the purpose to all respondents. Confidentiality and privacy were guaranteed for all participants throughout all steps of the research. This study was carried out at the full expense of the researchers, and there is no conflict of interest.

## Results

Table 1 summarizes the personal characteristics of 404 participants. Slightly more than half of them (50.7%) were males. Their age ranged between 19 and 65 years with a Mean±SD of 35.2 ±10 years. Almost two-thirds (69.1%) were married. The majority (87.6%) were university educated. More than half of participants (53.5%) were a government employee, whereas 10.1% were retired. Prevalence rate of current smoking among participants was 10.1%, whereas that of ex-smoking was 5.2%. There was history of chronic diseases among 13.9% of the participants. More than one-third of participants (38.4%) were overweight, whereas 32.4% were obese. Most participants (80%) reported low level of physical activity, whereas 17.1% reported moderate level of physical activity. High level of physical activity was reported among only twelve participants (3%).

As shown in Figure 1, vigorous physical activities (e.g., heavy lifting, digging, aerobics) were practiced by only 4% of patients, whereas moderate physical activities (e.g., carrying light loads, bicycling at a regular pace) were practiced by only 3% of participants, whereas walking was practiced by 49.8%.

Regarding duration of sitting (minutes/day), Figure 2 shows that 40.3% of participants reported sitting periods more than 360 minutes/day.

Table 2 shows that moderate and high physical activities were significantly more practiced by males than females (21.5% and 3.4% versus 12.6% and 2.5%, respectively,  $p=0.046$ ). However, there was no statistically significant associations between participants' physical activity and their age, marital status, educational level, body mass index, history of chronic diseases, or history of smoking.

Table 3 shows that the commonest barriers of practicing physical activities as reported by those who had low physical activity ( $n=323$ ) was presence of too few suitable places to exercise in their region (58.5%), followed by being not sure of their ability to exercise efficiently (37.2%), believing that exercise is hard work and they would be fatigued by it (35%) and they are too embarrassed to exercise (30.3%). Not sufficient energy for exercise because of health problems and having other recreational activities to do with friends were mentioned by 28.8% and 26.3% of the participants, respectively, as barriers for practicing physical activities.

Table 1: Personal characteristics of the participants (n=404)

Personal characteristics	No.	%
<b>Gender</b>		
• Male	205	50.7
• Female	199	49.3
<b>Age (years)</b>		
• 19-25	77	19.1
• 26-35	139	34.4
• 36-45	129	31.9
• >45	59	14.6
• Range	18-65	
• Mean±SD	35.2±10.0	
<b>Marital status</b>		
• Single	109	27.0
• Married	279	69.1
• Divorced/widowed	16	3.9
<b>Educational level</b>		
• Below secondary school	8	2.0
• Secondary school	42	10.4
• University	354	87.6
<b>Job</b>		
• Housewife	33	8.2
• Not working	79	19.6
• Governmental employee	216	53.5
• Private sector employee	35	8.7
• Retired	41	10.1
<b>Smoking history</b>		
• Current Smoker	44	10.9
• Ex-smoker	21	5.2
• Non-Smoker	339	83.9
<b>History of chronic diseases</b>	56	13.9
<b>Body mass index</b>		
• Underweight	12	3.0
• Normal	106	26.2
• Overweight	155	38.4
• Obese	131	32.4
<b>Levels of physical activity</b>		
• Low	323	80.0
• Moderate	69	17.1
• High	12	3.0

Figure 1: Types of physical activities practiced by attendants of primary health care centers in Abha City, Saudi Arabia

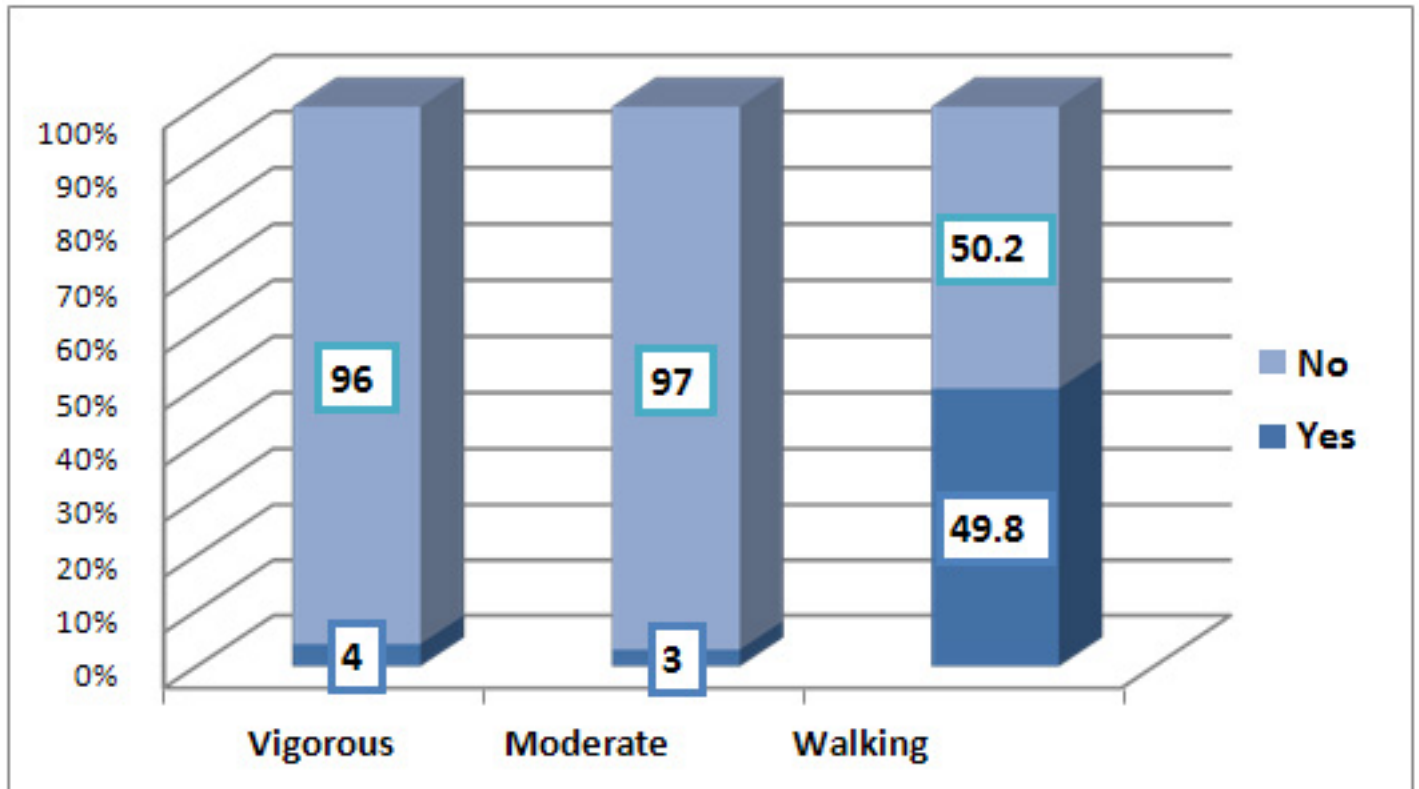
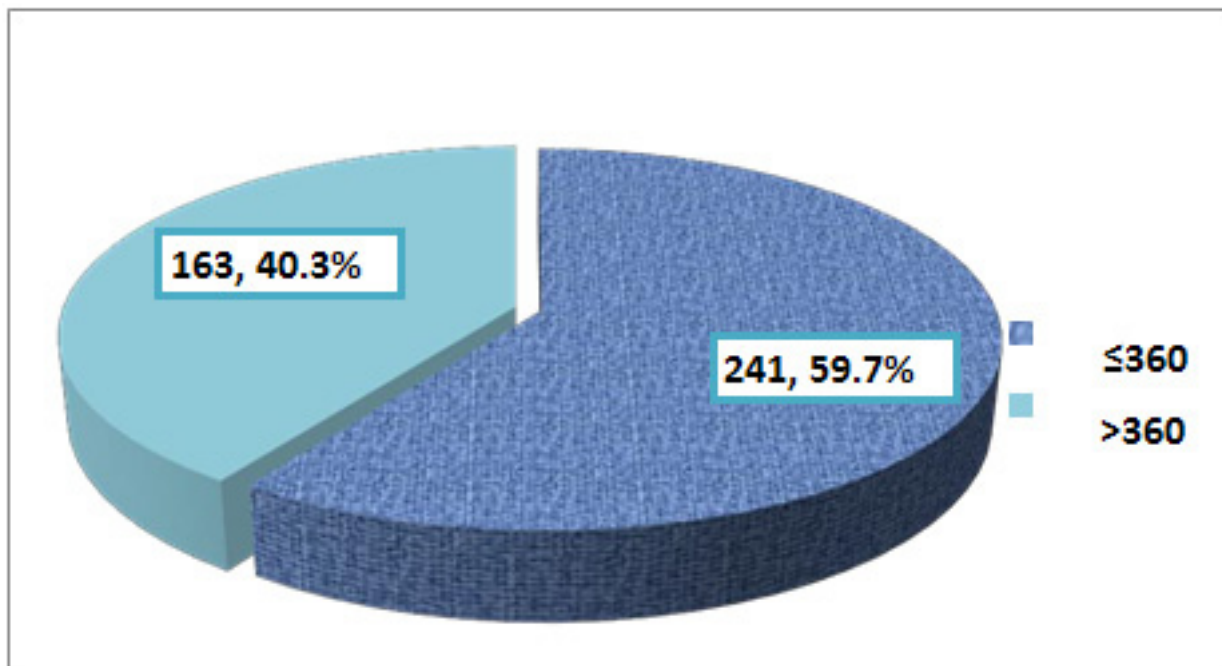


Figure 2: Duration of sitting (in minutes/day) among attendants of primary health care centers in Abha City, Saudi Arabia





**Table 2: Association between physical activity and personal characteristics of attendants of primary health care centers in Abha City, Saudi Arabia**

Personal characteristics	Levels of physical activity			P Value
	Low (n=323)	Moderate (n=69)	High (n=12)	
	No. (%)	No. (%)	No. (%)	
<b>Age (in years)</b>				0.165
• 18-25	58 (75.3)	19 (24.7)	0 (0.0)	
• 26-35	112 (80.6)	22 (15.8)	5 (3.6)	
• 36-45	101 (78.3)	22 (17.1)	6 (4.7)	
• >45	52 (88.1)	6 (10.2)	1 (1.7)	
<b>Gender</b>				0.046
• Male	164 (75.1)	44 (21.5)	7 (3.4)	
• Female	169 (84.9)	25 (12.6)	5 (2.5)	
<b>Marital status</b>				0.304
• Single	84 (77.1)	24 (22.0)	1 (0.9)	
• Married	226 (81.0)	43 (15.4)	10 (3.6)	
• Divorced/widowed	13 (81.3)	2 (12.5)	1 (6.3)	
<b>Educational level</b>				0.211
• Below secondary level	7 (87.5)	1 (12.5)	0 (0.0)	
• Secondary	30 (71.4)	12 (28.6)	0 (0.0)	
• University	286 (80.8)	56 (15.8)	12 (3.4)	
<b>Body mass index</b>				0.972
• Underweight	10 (83.3)	2 (16.7)	0 (0.0)	
• Normal	83 (78.3)	20 (18.9)	3 (2.8)	
• Overweight	124 (80.0)	27 (17.4)	4 (2.6)	
• Obesity	106 (80.9)	20 (15.3)	5 (3.8)	
<b>History of chronic diseases</b>				0.522
• No	279 (80.2)	60 (17.2)	9 (2.6)	
• Yes	44 (78.6)	9 (16.1)	3 (5.4)	
<b>History of smoking</b>				0.778
• Non-smoker (n=339)	271 (79.9)	57 (16.8)	11 (3.2)	
• Smoker (n=44)	36 (81.8)	8 (18.2)	0 (0.0)	
• Ex-smoker (n=21)	16 (76.2)	4 (19.0)	1 (4.8)	

**Table 3: Barriers against practicing physical activity among attendants of primary health care centers in Abha city, Saudi Arabia (n=323)**

Barriers	No.	%
Exercise is hard work. I am fatigued by it	113	35.0
I have not sufficient energy for exercise because of health problems	93	28.8
I have other recreational activities to do with friends	85	26.3
I am too embarrassed to exercise	98	30.3
I am not sure of my ability to exercise efficiently	120	37.2
There are too few suitable places to exercise in my region	189	58.5
I have no exercise facilities at home	18	5.6
My family and friends do not encourage exercising	23	7.1
I am giving priority to study and work than exercise	11	3.4
I have no time to exercise because of my academic curriculum and work	7	2.2
I have no time to exercise because of my family and social relationships	8	2.5
It costs too much money to exercise	13	4.0

## Discussion

The present study revealed that most participants (80%) had low level of PA, whereas only 3% had high level of physical activity. Regarding the type of PA, vigorous activities were practiced by only 4% of participants, whereas moderate activities and walking were practiced by 3% and 49.8%, respectively.

The low PA observed in this study is not surprising, as it has been reported by several other studies carried out in Saudi Arabia among the general population.

In Riyadh, Saudi Arabia, Al-Hazzaa (20) reported that very few Saudi adults were vigorously active. However, nearly half of the population was moderately active and walk for at least 30 minutes or more per day. The prevalence of physical inactivity among both genders was 40.6%.

In an earlier study, Al-Hazzaa reported that prevalence of inactivity in Saudi Arabia ranged between 43.3% and 99% (21). Moreover, Al-Zalabani reported a rate of physical inactivity among the Saudi population as 66.6% (22). In accordance with our findings, a Saudi study carried out among adults aged between 30-70 years reported a high level of physical inactivity reaching up to 96.1% (23).

In the Gulf Cooperation Council countries, the prevalence of PA ranged between 39.0% and 42.1% for men and 26.3% to 28.4% for women(24).

A study carried out in Brazil among adults aged 20 years and above, using the IPAQ short-form instrument found that prevalence of physical inactivity was 41.1% (25). In Sri Lanka,(26) it was reported that 60% of the study subjects were in the 'highly active' category, while only 11% were 'inactive'. In South Asian countries, a systematic review (27) concluded that the overall prevalence of physical inactivity ranged between 18.5% and 88.4% in India, 60.1% in Pakistan and 11%-31.8% in Sri Lanka. In Iran, Nikniaz et al. (28) reported that 28.47% of adults were inactive, 27.96% were minimally active, and 43.55% had health-enhancing PA. In Poland, Łobaszewski et al. (29) observed that 43% of adults had not walked for at least 10 minutes in their leisure time during the last week. The majority did not engage in any moderate or vigorous PA.

Differences between rates of PA reported in the present study and those reported in other studies could be attributed to either a real variation in the PA or due to differences in methodology applied, sampling techniques, study population characteristics, assessment tools or methods of data collection.

In the current study, moderate and high physical activities were more practiced by male patients compared to female patients. Similarly, Al-Nozha et al. (23) reported that females aged between 30 and 70 years were significantly more inactive, compared to males (98.1% versus 93.9%, respectively). Also, Al-Hazzaa (20) reported that males

were less engaged in moderate PA than females, whereas females were less engaged in vigorous PA compared with males. Al-Zalabani et al. (22) reported that prevalence of physical inactivity was higher in females than males (72.9% versus 60.1%, respectively).

In Sri Lanka, Katulanda et al. (26) reported that males had significantly higher weekly total MET minutes than females. In South Asian countries, females were more inactive compared to males (27). In Iran, Nikniaz and colleagues (28) reported that compared with women, men had significantly higher odds of being physically active.

The lower prevalence of PA among women in the present study was expected and it is most likely caused by cultural and social factors rather than biological factors, (30, 31) as in Saudi Arabia, within its conservative culture, women have restrictions to movement outside their homes and limited opportunities to attend health centers (32). Additionally, because of the hot climate most of the year, there is high dependency on air-conditioned automobiles. Moreover, having domestic assistants among most families seems to contribute to the low levels of PA among females (33).

In this study, although participants aged between 36 and 45 years were the most physically active, the difference from other age groups was not statistically significant. Al-Nozha et al. (23) observed that, with increasing age, physical inactivity increases. Al-Hazzaa (20) also reported that advancing age was significantly associated with physical inactivity. Al-Zalabani et al. (22) observed that people in the 55-64 year age group had a higher prevalence of physical inactivity compared to the other age groups. In Sri Lanka, those aged 70 years or above were more likely to be physically inactive (26).

Educational level was not significantly associated with level of PA in the present study. Other studies such as Al-Nozha et al. (23) observed that less educated adults were more physical inactive than more educated adults. Al Zalabani et al. (22) reported that people with higher education were less physically active in univariate analysis. However, after adjustment for confounders, this significance disappeared. In Sri Lanka, Katulanda et al. (26) reported that adults with tertiary education had lowest mean weekly total MET minutes. In Poland, Łobaszewski et al. (29) observed that adults with higher level of education were more physically active.

In the present study, body mass index and having chronic disease were not significantly associated with the PA level. This finding is in disagreement with those reported by several studies. In Sri Lanka, Katulanda et al. (26) reported that obese patients and those with hypertension, diabetes or metabolic syndrome were significantly associated with the risk of being physically inactive. In Iran, Nikniaz and colleagues (28) reported that normal weight adults were significantly more likely to participate in a high intense PA.

The difference between our findings and those of other studies may be attributed by that obesity among the Saudi population may be due to nutritional factors, such as overconsumption of unhealthy fast food, soft drinks, energy drinks, etc. (34).

In the present study, the commonest barriers to practicing physical activities as reported by participants who had low PA were presence of too few suitable places to exercise in their region, being not sure of their ability to exercise efficiently, believing that exercise is hard work and they are fatigued by it and they are too embarrassed to exercise. Other studies revealed lack of suitable places, time, financial limits and lack of facilities as a barrier to PA (35-37).

Among strengths of the present study was the use of IPAQ- short form Questionnaire-Arabic version to estimate the level of total PA, as it is a valid international tool. However, the self-reported nature of data collection regarding PA which may lead to over- or under-reporting of PA is considered a limitation. Moreover, the followed cross-sectional design is good for hypothesis generation rather than hypothesis testing. Finally, this study included attendants of PHC centers, thus the generalizability of our results should be taken with caution.

In conclusion, most Saudi adults attending PHC centers, in Abha City have a low level of PA. Males have significantly higher PA than females. There are several barriers against PA, including presence of few suitable places to exercise, being not sure of their ability to exercise efficiently, believing that exercise is hard work, and being embarrassed to exercise in public. Overcoming these barriers may contribute to the improvement of PA among the Saudi population. Moreover, since PA was lower among females, this group should be particularly addressed such as providing suitable places for both genders, particularly females, to practice physical exercise inside the health care facilities.

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