

# Evaluation of Young Adults' Physical Activity Status and Perceived Barriers in the Riyadh Region of Saudi Arabia

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**Background:** Physical activity (PA) is any prolonged movement produced by muscular tissues that cause the muscles to exert force. Despite its beneficial effect, it is frequently neglected by individuals. The present study aimed to determine the PA among young adults living in Saudi Arabia.

**Methods:** This cross-sectional study was conducted among Saudi adults living in the Riyadh region of Saudi Arabia from June to August 2022 through a self-administered online survey. Global Physical Activity Questionnaire was used to assess the PA among participants. The data were analyzed using statistical software SPSS v. 26.0 (SPSS Inc., Chicago, IL, USA).

**Results:** Among the surveyed adult males were the predominant 67.8% (n= 240). Most of them were young, aged between 24 to 34 years 62.4% (n=221), and 37.6% (n=133) of them were between 35 and 44 years old. The current findings reported that 63% (n=223) of the adults had PA on weekly basis. Walking 45.2% (n=160) followed by bodybuilding 12.7% (n=45) was the most common type of PA identified among adults. The barriers identified for not practicing PA were lack of time 46.9% (n=166). With regard to a sedentary lifestyle, it was reported that 9.55 (SD= 4.887) hours per day are spent sedentary or in a constant sitting. The adults gender ( $p=0.046$ ) employment ( $p=0.0001$ ) and educational status ( $p=0.0001$ ) was significantly associated with the type of PA engaged. Although being a female were shown more sitting behavior than males ( $p<0.047$ ), similarly the nationality of the adults (6.67; SD=1.649) ( $p <0.001$ ), education ( $p=0.028$ ) and monthly household income ( $p =0.024$ ) were significantly associated with the overall mean sitting behavior.

**Conclusion:** The findings of this study confirmed that Saudi adults yet posing highly sedentary behavior and physical inactivity, despite knowing the harmful outcomes of inactivity. Thus educating individuals about the importance of PA is warranted.

**Keywords:** walking, running, playing, football, weightlifting, sitting, sedentary behavior

## Introduction

Physical activity (PA) is any prolonged movement produced by our muscular tissues that cause the muscles to exert force.<sup>1</sup> PA involves everyday activities of various types and intensity tiers, as well as light, medium, and strong intensity.<sup>1,2</sup> PA offers numerous benefits, including improved social skills, maintaining good health and healthy body weight, and improved sleep quality.<sup>2</sup> PA can help reduce the risks of premature death, coronary heart disease, strokes, high blood pressure, a specific form of cancer, type 2 diabetes, osteoporosis, obesity, and weight problems, as well as improve mental health.<sup>3-6</sup> According to the World Health Organization (WHO), to acquire health benefits, adults aged 18-64 years must accumulate at least 150 minutes of moderate to vigorous intensity PA per week and muscle-strengthening activity at least 2 days a week.<sup>1,7</sup> According to literature PA can be divided into occupational, sporting, conditioning, domestic, and other activities.<sup>3-7</sup>

With regard to the country-wise PA status, the Netherlands has the most physically active people, spending over 12 hours a week exercising or participating in sports, followed by Germany and Romania.<sup>8</sup> In 2021, 19.3% of adult Americans were physically active with an average of 5.61 hours per day spent.<sup>9</sup> While studies indicated 29.7% of the

prevalence of PA in Saudi adults.<sup>10</sup> On the contrary, in the European region 23% of adults 18 and over were not physically active enough, with more women being physically inactive than men.<sup>11</sup> In United States Centre for disease control and prevention (CDC) and state health departments conduct the Behavioral Risk Factor Surveillance System (BRFSS), an ongoing state-based survey involving telephone interviews, there was an overall predominance of 25.3% of physical inactivity.<sup>8</sup> Similarly, 81% of adolescents 11–17 years of age were insufficiently active, with girls being more inactive than boys.<sup>11</sup>

A high prevalence of physical inactivity was found among adults in Saudi Arabia.<sup>12–14</sup> For instance, a recent national wide survey reported 82.6% of adults were inactive physically,<sup>12</sup> while another study by Al-Nozha et al found 96.1% of the prevalence of physical inactivity.<sup>13</sup> Similarly Amin et al, reported 80% of Saudi adults are not achieving adequate levels of PA with beneficial health effects.<sup>14</sup> Previous research has demonstrated that Saudi Arabian adults do not engage in enough PA to have a positive impact on their health.<sup>5,12–14</sup> The regular practice of PA has a positive impact on seven of the ten most common chronic diseases.<sup>7,8</sup> Despite the positive health benefits of the PA, 80% of American adults do not meet basic aerobic and muscle-strengthening activity guidelines, and only half meet the aerobic activity standard.<sup>16</sup> Healthcare expenses related to the lack of PA amount to over \$117 billion annually, and almost 10% of all deaths are premature.<sup>16</sup>

The reason for the lack of PA among adults was various according to studies and across countries.<sup>5,17</sup> For example, American Heart Association reported a lack of time, a lack of motivation, a lack of resources, too much work, or frequent travel because of the job are the hurdles that prevent persons from engaging in PA.<sup>17</sup> However, a comprehensive analysis found that people in Saudi Arabia find PA a challenging choice because of rising urbanization, congested traffic, inclement weather, cultural hurdles, a lack of social support, the absence of female school PA programs, and a lack of time and resources.<sup>5</sup> Furthermore, increased age, and monthly income were other possible barriers to physical inactivity among adults and was correlated with PA.<sup>5</sup> Furthermore women's barriers to involvement are higher than men's and rise with age.<sup>18</sup> At the same time, environmental factors showed the strongest relationship with physical inactivity.<sup>18</sup> Similarly another recent study among Spanish Adults during the COVID-19 Pandemic found a positive correlation between PA and an active coping style, with adults who were frequently active physically during the pandemic, predicting anxiety symptoms. Furthermore, research revealed that adults used exercise as a coping mechanism to manage emotional distress indicating the beneficial effects of exercise for the control of negative states like anxiety which signifies the importance of PA for the mental well-being of the population.<sup>19</sup>

In the Eastern Mediterranean Region (EMR), Saudi Arabia is one of the largest and wealthiest countries. In recent decades, it has experienced rapid socioeconomic development, along with shifts in population standards of living toward sedentary behavior and a high-calorie diet pattern.<sup>20</sup> Modern technological progress has led to humans lowering the amount of PA that they need, unfortunately, this led to a scenario of major negative changes in lifestyle and contributed to an increase in lifestyle-related NCDs in the country.<sup>15,21–23</sup> Saudi vision plan 2030 had come forth with a social-related approach. One of the aims of Saudi Vision 2030, is to promote the practice of sports activities in the community which emphasizes the importance of PA for at least 30 minutes per week. This initiative is an indicator of the Vision Program's Quality of Life Program. This innovative concept of attention to better people's quality of life is only now emerging in developed and less developed countries. To address this gap in the literature, the present study described PA status among young adults aged between 24 and 40 years residing in the capital city of KSA and examined the frequency of intensity of PA in their daily routine, and common barriers. Thus the findings of this study aimed at assessing the PA status among adults in the Riyadh region of Saudi Arabia.

## Methods

### Study Design, Setting, and Population

A cross-sectional study was carried out by young adults in Riyadh region, Saudi Arabia to assess and capture the PA status. It was a prospective self-reporting survey using an online questionnaire-based study conducted between June to August 2022. Our targeted population includes adults aged  $\geq 18$  years, both genders, able to understand Arabic, and willing to complete the survey. Others who do not match the inclusion criteria, and living in other regions of Saudi

Arabia, mentally ill adults, or adults with psychological illness were excluded from the study. Respondent's anonymity and confidentiality were ensured throughout the study. Furthermore, this study followed the guidelines of the Declaration of Helsinki, as well as appropriate safeguards regarding the rights and welfare of the human participants.<sup>24</sup>

## Sample Size Estimation

According to previous reports, the prevalence of PA among Saudi adults was 29.7%.<sup>10</sup> The sample size for the given study was calculated by using the following equation:

$$n = z^2 \times p \times q / d^2$$

where  $n$  is the minimum sample size,  $z$  is the constant (1.96),  $p$  is the prevalence of PA (0.297%),  $q$  is  $(1 - p)$ ,  $Z$  is the standard normal deviation of 1.96 corresponding to the 95% confidence interval, and  $d$  is the desired degree of accuracy.

$$n = (1.96)^2 \times 0.297 (1-0.297) / (0.05)^2$$
$$n = 320$$

but we decided to survey 400 individuals in an attempt to ensure higher reliability. A total of 354 filled responses were obtained giving a response rate of 88.5%.

To capture the status of PA the questionnaire was adopted based on previous studies published in a similar context.<sup>12,25</sup> The questionnaire was initially designed in the English language and later translated into the local Arabic language using forward and backward translation procedures. A prevalidated Global Physical Activity (GPA) Questionnaire developed by the world health organization consisted of a total of 16 items.<sup>25</sup> The 16-item tool was further divided into four domains. Domain one focused on Activity at work with a total of six items, which includes work involving vigorous activity that significantly raises breathing or heart rate, such as carrying or lifting heavy loads, or work involving moderate activity that raises breathing or heart rate only slightly, such as brisk walking for at least 10 minutes continuously, spending time performing such activities. In addition to this, this domain also collected information weekly on how many days and how long you spend engaging in moderately intense activity.

However, domain two focused on traveling to and from locations (3 items), such as using a bicycle or walking, and how much time and the number of days was spent on these activities each week. Recreational activities consisted of 6-items which includes vigorous-intensity and moderate-intensity sports, fitness or recreational (leisure) activities playing games or running for at least 10 minutes, the number of days (In a week), and time (in a day) of doing such activity and the last domain focused on sedentary behavior with one item (How much time do you usually spend sitting or reclining on a typical day). All these questionnaires were assessed on the binary scale and continuous scale. Similarly, to previous studies,<sup>26-33</sup> before beginning the study, the designed questionnaire was validated in two steps. First, the initial draft is evaluated by a research expert in the related field, to check the accuracy of the content and flow of the questionnaire. Secondly, a pilot study was conducted among a randomly selected sample of ( $n=30$ ) individuals to give their opinions and also to know the feasibility of the study and also for pre-testing the questionnaire. Written informed consent was obtained from the undergraduate students. If any amendments from the pilot study are then unified into the final questionnaire. The reliability test was done by calculating Cronbach's alpha using SPSS v.26, which was found to be 0.85. The data from the pilot study was not included in the final analysis.

The final questionnaire was then distributed using online survey tools. Google Form was created, and participants were invited through the social media applications such as WhatsApp, Twitter, and Facebook. Other methods to improve the response rate were considered such as Emails. An invitation link containing a survey questionnaire was sent to the participants. For the data collection, we used the snowball technique where any person recruited to do the survey provides multiple referrals.

## Statistical Analysis

To summarize data on socio-demographic characteristics, descriptive statistical methods were used. For categorical variables, data were summarized as frequencies ( $n$ ) and percentages (%). The continuous data were presented in the form

of mean and standard deviations. Statistical Package for Social Sciences version 26.0 (SPSS Inc., Chicago, IL, USA) was used to analyze the data. To find out the significant association between the variables, the chi-square or Fisher exact test was used and a p-value of 0.05 was considered statistically significant.

## Results

A total of 354 young adults completed the questionnaires giving a response rate of 88.5% (Figure 1). Among those males were the predominant participants (n= 240; 67.8%). Most of them were young, aged between 24 and 34 years (n=221;62.4), followed by 37.6% (n=133) of the adults between the age ranges of 35–44. years and were Saudi nationals (91.0%). More than half of the adults (57%) reported a monthly income of >7000 Saudi Riyals. More than half 63% of the adults had a university level of education while most of the adults were employed (41.2%) respectively. The demographic characteristics of the adults in the study sample are shown in Table 1

The current findings reported that two third of the adults 63% (n=223) had PA on weekly basis, while 37.0% of them were do not do any PA. With regard to the most common type of PA was walking (n=160) at 45.2% followed by bodybuilding (n=45) at 12.7% and playing football or volleyball at 6.2%, running at 3.1% (n=11), swimming at 2.0% (n=7), cycling 3.7% (n=13) respectively (Figure 2).

Among the adults, the most commonly identified barrier for not practicing PA was lack of time 46.9% (n=166), followed unwillingly to practice due to unknown reasons 17.8 (n=63), other reasons 30.8% (n=109) lack of facilities 2.3% (n=8) and injury 2.3% (n=8) (Figure 3).

Table 2 illustrates the time and characteristics of different types of PA in a typical week. In at least 10 minutes of work, only 23.2% (n=82) involved vigorous-intensity activity that caused high levels of breathing or heart rate (carrying or lifting heavy loads, digging, or construction work). In a typical week, 6.26 (1.569) were the average number of days'

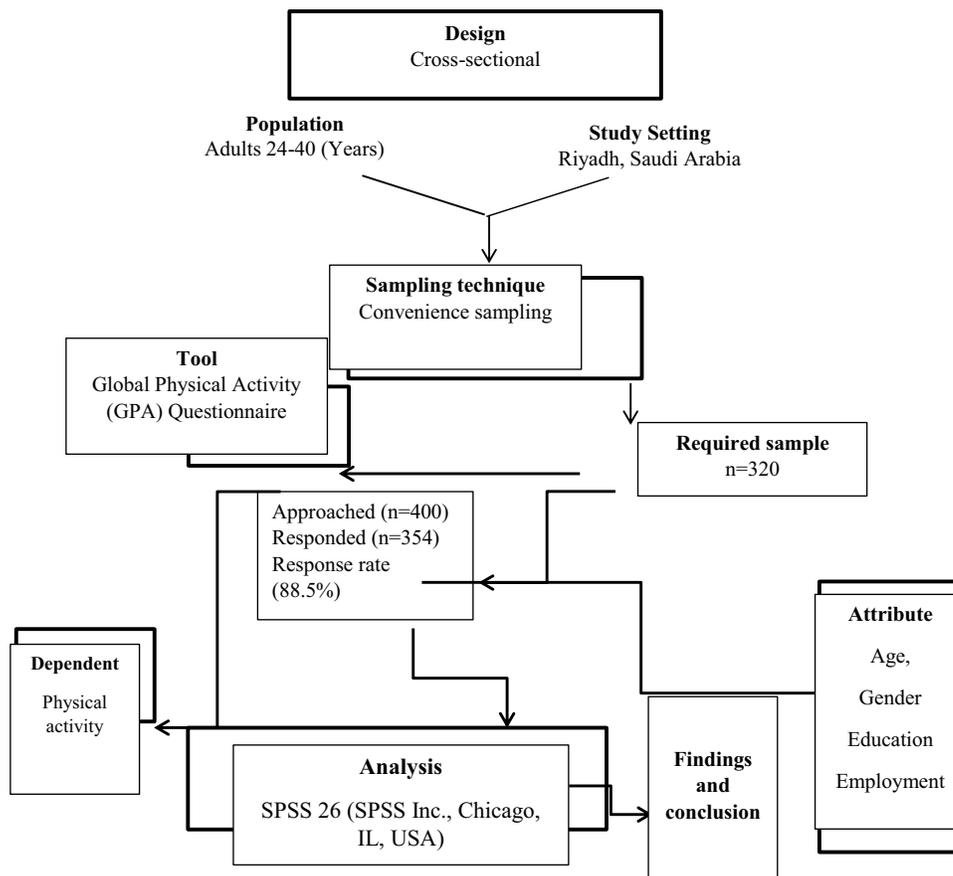


Figure 1 Flow chart of the study.

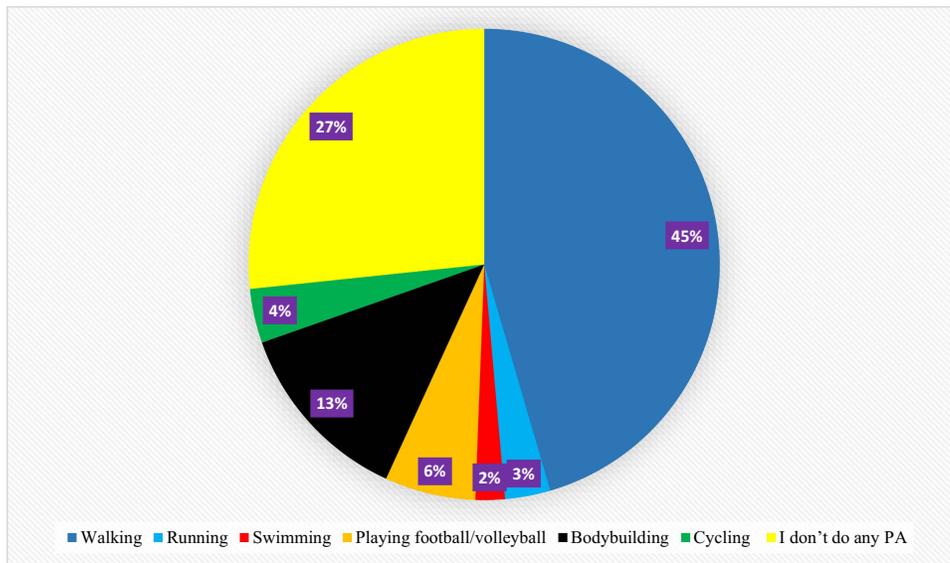
**Table 1** Baseline Characteristics of the Participants  
(n = 354)

Variables	(n)	(%)
<b>Gender</b>		
Male	240	67.8
Female	114	32.2
<b>Age (years)</b>		
24–34	221	62.4
35–44	133	37.6
<b>Nationality</b>		
Saudi	322	91.0
Non-Saudi	32	9.0
<b>Education</b>		
Secondary or equivalent	84	23.7
University	223	63.0
Master's degree	36	10.2
Doctorate	11	3.1
<b>Marital status</b>		
Married	158	44.6
Unmarried	196	55.4
<b>Employment status</b>		
Employed	146	41.2
Unemployed	140	39.5
Student	10	2.8
Housewife	58	16.4
<b>Monthly household income over the last 12 months</b>		
>7000 Saudi Riyals	193	54.5
8000–10, 000 Saudi Riyals	49	13.8
11–20, 000 Saudi Riyals	50	14.1
<21, 000 Saudi Riyals	62	17.5
<b>Do you do any type of physical activity on weekly basis?</b>		
Yes	223	63.0
No	131	37.0

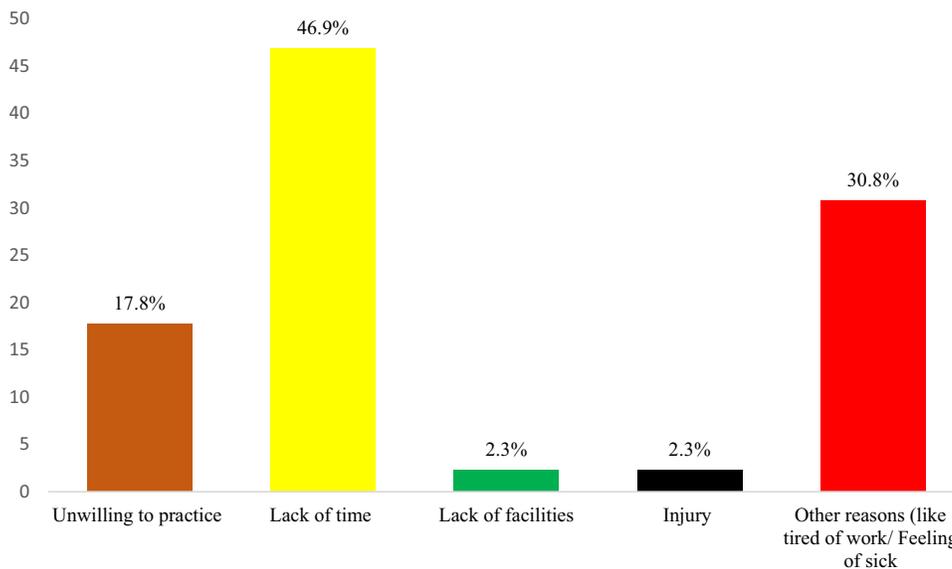
adults spent active in vigorous intensity activities, while 5.11 hours (SD=0.907) (median= 5) were the average number of hours they spent active (Table 2).

According to this study, on a typical workday, adults spend 5.11 hours (SD 0.907) doing vigorous-intensity activities. In contrast, 54.5% (n=193) of the adult's work involves moderate-intensity activity that causes small increases in breathing or heart rate, such as brisk walking (or carrying light objectives). In terms of moderate-intensity activity, every week, adult's spent an average of 6.00 days (SD=1.74), and 5.59 hours (SD1.40) were spent practicing moderate-intensity activity in a day. There were 39.8% (n=141) of adults who cycled their bicycles for at least 10 minutes to and from places. In terms of the number of days spent walking or cycling for 10 minutes continuously to get to and from places in a week, 5.88 were the average number of days (Table 2).

Moreover, 49.7% (n=176) of the adults performed vigorous-intensity sports, fitness, or recreational activities that cause large increases in breathing or heart rate like running or football for at least 10 minutes continuously. A mean of



**Figure 2** Most common types of physical activity.



**Figure 3** Barriers of physical activity among participants.

4.63 hours (1.51) per day was devoted to vigorous-intensity sports and fitness activities by the adults in this study. Over one-third of 130 (36.7) of the adult’s work involves moderate-intensity sports, fitness, or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, (cycling, swimming, volleyball) for at least 10 minutes continuously. With regards to a sedentary lifestyle, it was reported that 9.55 (SD 4.887) hours per day are spent sedentary or in a constant sitting. The detailed responses of the patients were given in Table 2.

Our analysis revealed that 35.3% (n=125) of the adults engaged in vigorous-intensity activity twice a week, while 44 (12.4%) did so three times a week. About 27.4% (n=97) of the adults participated in moderate-intensity activities twice a week, and 116 (32.8%) participated in vigorous-intensity activities once a week. Detailed descriptions of the responses are shown in Table 3.

The most common physical activity and the demographic characteristics of the study participants were significantly associated. For example, gender was substantially associated with the type of physical activity engaged ( $p=0.046$ ). The

**Table 2** Time and Characteristics of Different Types of PA in a Typical Week

Variables	Frequency n (%)	Mean (SD)
Does your work involve a vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging, or construction work] for at least 10 minutes continuously? Yes No	82 (23.2) 272(76.8)	
In a typical week, how many days do you do vigorous-intensity activities as part of your work?		6.26(1.569) Median (6)
How much time do you spend doing vigorous-intensity activities at work on a typical day?		5.11(0.907) Median (5)
Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously? Yes No	193(54.5%) 161(45.5%)	————
In a typical week, how many days do you do moderate-intensity activities as part of your work?		6.00(1.74) Median (6)
How much time do you spend doing moderate-intensity activities at work on a typical day?		5.59(1.40) Median (6)
Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? Yes No	141(39.8) 213(60.2)	————
In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places		5.88(2.17) Median (7)
Do you do any vigorous-intensity sports, fitness, or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football.] for at least 10 minutes continuously? Yes No	176(49.7) 178(50.3)	————
In a typical week, how many days do you do vigorous-intensity sports, fitness, or recreational (leisure) activities		4.63(1.51) Median (5)
How much time do you spend doing vigorous-intensity sports, fitness, or recreational activities on a typical day? (Please write the number of Hours)		8.34(1.191) Median (9)
Do you do any moderate-intensity sports, fitness, or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, (cycling, swimming, volleyball) for at least 10 minutes continuously? Yes No	130(36.7) 224(63.3)	————
How much time do you spend doing moderate-intensity sports, fitness, or recreational (leisure) activities on an atypical day		6.66(1.607) Median (8)
How much time do you usually spend sitting on a typical day?		9.55(4.887) Median (7)

type of physical activity among adults was also associated with the participants' employment ( $p=0.0001$ ) and educational status ( $p=0.0001$ ). The current findings reported that there was no association between the participants' age, marital status, and the type of physical activity they engaged in during the study (see [Table 4](#)).

Regarding the association between age, gender, nationality, and Physical activity status, we found that there was no significant effect on the Physical activity status of adults ( $p=0.05$ ) concerning their demographics ([Table 5](#)). Although the overall mean sitting behavior among the adults was significantly associated with gender, where being a female were shown more sitting behavior than males ( $p<0.047$ ). Similarly, the nationality of the adults, (where being a Saudi was shown more sitting behavior than non-Saudi) (6.67;  $SD=1.649$ ) ( $p <0.001$ ), education ( $p=0.028$ ) and monthly household income ( $p =0.024$ ) of the adults were significantly associated with mean sitting behavior of the adults. Detailed information Influence of adults 'characteristics on their sitting behavior was given in [Table 6](#).

**Table 3** Frequency of Participants in Engaging Physical Activity on Weekly Basis

Physical Activity Questionnaire	0 Days n (%)	1 Day n (%)	2 Days n (%)	3 Days n (%)	4 Days n (%)	5 Days n (%)	6 Days n (%)	7 Days n (%)
How many days per week do you engage in vigorous-intensity activity?	116(32.8)	25(7.1)	125(35.3)	44(12.4)	22(6.2)	14(4.0)	6(1.7)	2(0.6)
How many days per week do you engage in moderate-intensity activities?	98(27.7)	42(11.9)	97(27.4)	53(15.0)	21(5.9)	33(9.3)	5(1.4)	5(1.4)
How many days per week do you engage in walking or bicycling for at least 10 minutes	103(29.1)	81(22.9)	43(12.1)	50(14.1)	13(3.7)	29(8.2)	7(2.0)	28(7.9)
How many days per week do you engage in vigorous-intensity sports, fitness, or recreational activities?	124(35.0)	103(29.1)	48(13.6)	32(9.0)	14(4.0)	27(7.6)	2(0.6)	4(1.1)
How many days per week do you engage in moderate-intensity sports, fitness, and activities?	178(50.3)	41(11.6)	53(15.0)	34(9.6)	12(3.4)	24(6.8)	3(0.8)	9(2.5)

**Table 4** Cross-Tabulation Between the Participant's Demographic Characters and Type of Physical Activity Engaged

Participants Characters	Walking n (%)	Swimming n (%)	Running n (%)	Playing Games n (%)	Body Building n (%)	Other Activities n (%)	I Do not Do Any Physical Activity n (%)	p-value
<b>Gender</b>								
Male	106(66.3)	02(28.6)	10(90.9)	18(81.8)	32(71.1)	6(46.2)	66(68.8)	0.046*
Female	54(33.8)	05(71.4)	01(9.1)	04(18.2)	13(28.9)	07(53.8)	30(31.3)	
<b>Age (years)</b>								
24–34	104(65)	02(28.6)	06(54.5)	11(50)	30(66.7)	06(46.2)	62(64.6)	0.268*
35–44	56(35)	05(71.4)	05(45.5)	11(50)	15(33.3)	07(53.8)	34(35.4)	
<b>Education</b>								
Master's degree	12(7.5)	01(14.3)	01(9.1)	03(13.6)	03(6.7)	0(0.0)	16(16.7)	0.001*
Doctorate	07(4.4)	02(28.6)	0(0.0)	0(0.0)	0(0.0)	02(15.4)	0(0.0)	
Secondary	43(26.9)	02(28.6)	03(27.3)	02(9.1)	13(28.9)	01(7.7)	20(20.8)	
University student	98(61.3)	02(28.6)	7(63.6)	17(77.3)	29(64.4)	10(76.9)	60(62.5)	
<b>Marital status</b>								
Married	82(51.2)	03(42.9)	05(45.5)	11(50.0)	16(35.6)	05(38.5)	36(37.5)	0.347
Unmarried	78(48.8)	04(57.1)	06(54.5)	11(50.0)	29(64.4)	08(61.5)	60(62.5)	
<b>Employment status</b>								
Housewife	36(22.5)	02(28.6)	04(36.4)	03(13.6)	02(4.4)	0(0.0)	11(11.5)	0.029*
Unemployed	04(2.5)	0(0.0)	0(0.00)	0(0.00)	0(0.0)	02(15.4)	04(4.2)	
Employed	61(38.1)	02(28.6)	01(0.0)	10(45.5)	23(51.1)	06(46.2)	43(44.8)	
Student	59(36.9)	03(42.9)	06(54.5)	09(40.9)	20(44.4)	05(38.5)	38(39.6)	

Note: \*Fisher exact test.

## Discussion

This study assesses PA among adults in Saudi Arabia using a cross-sectional survey. It was evidenced that PA has significant and positive various health outcomes. Although our study demonstrated that 63.6% of adult Saudis were physically active. These findings were better than earlier findings of Badar et al, 28.3% of the adults in Saudi Arabia and Mengesha in 54.9% of Ethiopia adults, and Al-Zalabani in the Saudi adults reported 33.4% were physically active.<sup>12,34,35</sup> Thus the current findings evidenced that a considerable amount of adults in Riyadh were yet inactive. These findings were comparable to earlier national and international findings.<sup>12,34,35</sup> The reason for the physical inactivity could be due to strict laws in the respective countries, such as Saudi Arabia, where women are not allowed to leave the country, or due to the country's harsh climatic nature, such as high or low temperatures, and the occurrence of storms.

However, the current findings were still lower than those reported by Lau et al in 2021, who indicated that 83.3% of adults were physically active.<sup>36</sup> On the other hand, a recent review of the assessment of PA prevalence in Arab countries

**Table 5** Influence of Age, Gender and Nationality on Their Physical Activity Status

Participants Characters	Physical Activity on Weekly Basis		P-value
	Yes N (%)	No n (%)	
<b>Gender</b>			
Male	152(63.3)	88(36.7)	0.848
Female	71(62.3)	43(37.7)	
<b>Age (years)</b>			
24–34	135(61.1)	86(38.9)	0.338
35–44	88(66.2)	45(33.8)	
<b>Nationality</b>			
Saudi	199(61.8)	123(38.2)	0.140
Non-Saudi	24(75)	08(25)	

**Table 6** Influence of Respondents' Characteristics on Their Sitting Behavior

Participants Characteristics	Mean Sitting Score			p- value
	Mean (SD)	F Value	t-Value*	
<b>Gender</b>				
Male	6.62(1.66)	—	-0.611	0.047
Female	6.73(1.46)			
<b>Age (full years)</b>				
24–34	6.67(1.525)	—	0.142	0.078*
35–44	6.65(1.651)			
<b>Nationality</b>				
Saudi	6.67(1.649)	—	0.363	<0.001
Non-Saudi	6.56(1.105)			
<b>Education</b>				
Secondary or equivalent	6.70(1.691)	3.063	—	0.028**
University	6.54(1.615)			
Master's degree	7.38(1.102)			
Doctorate	6.36(1.689)			
<b>Marital status</b>				
Married	6.76(1.556)	—	-1.102	0.418
Unmarried	6.57(1.645)			
<b>Employment status</b>				
Employed	6.84(1.496)	1.857	—	0.137**
Unemployed	6.61(1.677)			
Student	6.80(1.549)			
Housewife	6.27(1.673)			
<b>Monthly household income over the last 12 months</b>				
>7000 Saudi Riyals	6.54(1.657)	3.172	—	0.024**
8000–10, 000 Saudi Riyals	6.28(1.707)			
11–20, 000 Saudi Riyals	6.94(1.346)			
<21, 000 Saudi Riyals	7.08(1.463)			

Note: \*Independent sample t-test. \*\*ANOVA.

revealed PA prevalence between 34.2 to 96.9% respectively.<sup>37</sup> Similarly, another study in Armenia found that just 78.4% of participants were physically active.<sup>38</sup> The variance in incidence and prevalence rates was due to differences in the instruments used to assess PA as well as the case definition for 'physically active'.<sup>37</sup> Furthermore, adults who were physically active their entire lives were shown to be significantly less susceptible to the disease than those who lived a more sedentary lifestyle. Furthermore, physical inactivity is on the rise these days for a variety of causes, including the adoption of Western culture or unhealthy eating habits.

In this study, the most commonly practiced PA among adults was walking, followed by bodybuilding and playing football or volleyball. Similar results were reported in a recent study by Badar et al, who found 56% of individuals reported walking was the commonly practiced PA, followed by playing football and bodybuilding.<sup>12</sup> This is because the preference for PA is mainly depending on comfort and availability as well as access ability, for instance, walking is a free easy exercise with little effort and benefits your physical as well as mental health. Most people consider walking as a simple and incredibly beneficial form of PA that is very accessible.

Although in this study work-related vigorous-intensity activity that causes large increases in breathing or heart rate was reported among 23.2% of the adults. Similarly, 54.5% of them agreed that their work involves moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking. These findings are following the preceding findings from Saudi Arabia and other developing countries.<sup>34,35</sup> For instance, a population-based study found that 15.5% of the participants performed a vigorous-intensity activity that causes large increases in breathing.<sup>34</sup> On the other hand, 56% of them performed, a moderate-intensity activity that causes small increases in breathing.<sup>34</sup> Similarly the data from Saudi Arabia shows that 20.2% of the population was physically active at work side.<sup>35</sup>

Interestingly a majority of physically active adults also reported being sedentary with an average of 9.55 hours in a typical day, while Meyer et al in 2020, among American adults, reported similar findings where the author concluded that constant sitting of > 8 h/day, despite being physically active.<sup>39</sup> Similarly, another study in Saudi Arabia reported a high prevalence of sedentary behavior.<sup>35</sup> Sedentary behaviors are most widespread among adults as a result of inactivity during leisure time as well as sedentary conduct at work, home, or work from home and adopting technologies in transportation to reach on the time to their workplaces.

The results of the current study also showed that women are more likely than men to engage in sedentary activity. While these findings were opposed to previous findings in Saudi Arabia where the author found that PA was reported higher among females (21.9%) than males (18.3%).<sup>35</sup> In this study we did not find any significant association between age, gender, nationality, and Physical activity status, of adults. Although the overall mean sitting behavior among the adults was significantly associated with the nationality of the adults, education, and monthly household income. While another study found that college students, those who practice manual tasks, those who are single, and respondents from one-member families were significantly associated with doing physical activity.<sup>40</sup> Being a foreigner tends to make a person more loyal at work than being a native since all ex-pats leave their country in search of employment opportunities, so they may work better. Women are constantly preoccupied with taking care of household duties and managing family-related activities in addition to their professional responsibilities, and some of the women in this study did not work for pay. The high rates of sedentary behavior among females and participants' nationality may be attributed to these causes.

Furthermore, according to WHO, the majority of the world's population (80%) is physically inactive, and one in every four persons globally does not meet the global recommendation levels of PA.<sup>1</sup> Individuals should engage in at least 150 minutes of moderate-intensity PA or 75 minutes of vigorous-intensity PA per week. Although physical inactivity is a substantial public health issue connected with the development of numerous metabolic disorders. Furthermore, they discovered that insufficiently active persons had a 20% to 30% higher risk of death than sufficiently active people.<sup>1</sup> Therefore, it was crucial to comprehend and motivate people to engage in physical activity because it has numerous positive effects on a human's body. Even though it is the responsibility of today's adults to educate and counsel the next generation about various health-related advice, doing so helps someone live a healthy life, and determining a person's PA status would help them better achieve a healthy presence. Additionally, it is essential to provide teaching initiatives about PA through a variety of awareness-raising campaigns and poster displays. It can benefit adults' knowledge and practice of PA to have such activities and standards present in Arabic culture.

This study has some limitations. First, the results were based on a self-completed questionnaire, which may have increased the possibility of biases such as social desirability bias or recall bias. Second, the results were derived from a single region in Saudi Arabia, third, the participation rate is considered low among the whole sample and extremely low from the total population of Riyadh region, which limited the generalizability of the results making them not-representative of others, and not generalizable globally. Fourthly, the study did not involve adults aged above 45 years and old as it was conducted in the young generation. Lastly, the data were collected using google forms, for this purpose one should have internet access, given this, lacking internet might be one of the reasons for the lower sample size or not reaching the survey in all young adults. Furthermore, it is purely descriptive and focuses on capturing the status of physical activity from various perspectives. Despite these limitations, such a report is critical in revealing such issues first, if excess inactivity exists, then further investigating their clinical impact and demonstrating strategies to fix them later. Our findings suggest more emphasis on increasing the awareness of youth towards the importance of PA to make them more competent in raising awareness and posing a healthy lifestyle.

## Conclusion

In conclusion, the majority of Saudi adults engaged in physical activity. Walking, bodybuilding, and playing football were the most often mentioned physical activities. Furthermore, despite being aware of the negative effects of inactivity, the individuals in this study continue to exhibit excessively sedentary behavior and physical inactivity. It is commonly recognized that both excessive sitting and inactivity harm one's physical and mental health. Our research could aid in the investigation of the most practical methods for increasing adults' awareness and knowledge about Physical activity. Educating and creating awareness about the importance of physical activity as well as the establishment of additional facilities like open parks, grounds and foot walk in their facilities where peoples live are all important things to take. Incorporating Physical activity into everyday practice will undoubtedly enhance health outcomes, reduce the incidence of various cardiovascular and other diseases, and have a favorable impact on an individual's health in the future.

## Institutional Review Board Statement

This study was approved by the ethics committee at the college of medicine King Saud University, Riyadh Saudi Arabia with the following Approval of the Research Project (E-22-7368). Although before the beginning of the study or questionnaires, there was a statement about the informed consent and confidentiality of the data, who agreed and proceed to the study were considered as informed consent (Verbal) and included in the study.

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## Disclosure

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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