

2023

## Barriers to Physical Activity Participation Among University Students in Saudi Arabia

Z. A. Al Salim

*Sport Science and Physical Activity Department, University of Hafr Al Batin, Hafr Al Batin, Kingdom of Saudi Arabia, drzuhair@uhb.edu.sa*

Follow this and additional works at: <https://digitalcommons.aaru.edu.jo/isl>

---

### Recommended Citation

A. Al Salim, Z. (2023) "Barriers to Physical Activity Participation Among University Students in Saudi Arabia," *Information Sciences Letters*: Vol. 12 : Iss. 1 , PP -.

Available at: <https://digitalcommons.aaru.edu.jo/isl/vol12/iss1/30>

This Article is brought to you for free and open access by Arab Journals Platform. It has been accepted for inclusion in *Information Sciences Letters* by an authorized editor. The journal is hosted on [Digital Commons](#), an Elsevier platform. For more information, please contact [rakan@aarj.edu.jo](mailto:rakan@aarj.edu.jo), [marah@aarj.edu.jo](mailto:marah@aarj.edu.jo), [u.murad@aarj.edu.jo](mailto:u.murad@aarj.edu.jo).

# Barriers to Physical Activity Participation Among University Students in Saudi Arabia

Z. A. Al Salim

Sport Science and Physical Activity Department, University of Hafr Al Batin, Hafr Al Batin, Kingdom of Saudi Arabia

Received: 12 Jun. 2022, Revised: 22 Aug. 2022, Accepted: 4 Sep. 2022.

Published online: 1 Jan. 2023.

**Abstract:** This study aimed to determine the level of physical activity and the effect factors that prevent university male and female students from participating in physical activities. Six hundred and eight students from the University of Hafr Al Batin in Saudi Arabia participated in the study. Male students were 263, and female students were 345 from four university branches. The participants were between 18 – 24 years of age. The measurement instrument included the International Physical Activity Questionnaire short form (IPAQ-SF) and the Barriers to Being Active Quiz (BBAQ). The results of this study indicated that approximately 33% of participants had low physical activity, 42% of college students had moderate physical activity, and 25% had high physical activity. In general, female university students had greater barriers to being physically active than male university students. In addition, barriers to being physically active for students with low physical activity were significantly higher than for those with moderate and high physical activity. Also, female students had more barriers to being physically active than male students in four barrier categories that were lack of resources, social influence, lack of willpower, and lack of skill. Finally, university students who participate in physical activity after college had less barriers to being physically active than students who did not participate in physical activity. In conclusion, understanding the barriers that prevent to be physically active helps consider and solve them in order to reach the WHO's recommendation for physical activity.

**Keywords:** Barriers, Physical activity, University students, Hafr Al Batin.

## 1 Introduction

A sedentary lifestyle describes by little or no physical activity is widespread among adults in contemporary society. This lifestyle increases body mass index, leading to many secondary diseases such as type two diabetes, high blood pressure, and osteoporosis. In contrast, being physically active can reduce the risk of diseases, improve muscle and bone strength, and help maintain a healthy weight. Physical activity plays a vital role in improving physical, cognitive, and psychological functions. Physical activity defines "any body movement production by skeletal muscles that requires energy expenditure." Regular participation in moderate physical activity such as brisk walking, running, cycling, swimming, and group sports has excellent benefits for all ages and helps reach recommended activity levels. World Health Organization (WHO) recommended that adults participate at least 150 minutes per week in moderate physical activity or at least 70 minutes per week in high-intensity physical activity. According to World Health Organization [1], physical inactivity increases with age, and females participate less in physical activity than males. Globally, more than 25% of the adult population are not physically active, and females are insufficiently physically active than males. According to Alqahtani, Alenazi, Alhowimel, and Elnaggar [2], 91% of Saudi female adults were physically inactive, while 71% of Saudi male adults were physically inactive may lead to reflect negatively on their health.

Participating in physical activity inside and outside university hours helps students reduce the risk of obesity. Obesity has become one of the most critical public health problems. According to the World Health Organization [3], obesity in the world has more than tripled since 1975, and in 2016, more than 39% of adults (bigger than 17 years old) were overweight, and 13% were obese. Children and adolescents in the Middle East have higher rates of overweight and obesity, and one of the fastest increasing averages in the world is Saudi Arabia [4]. Only 3.4% of adolescents were obese in 1988, while 24.5% of Saudi adolescents were obese in 2005 [5]. In addition, a report indicated that more than 43.6% of Saudi boys (aged between 14 to 19 years) and 34.8% of Saudi girls (aged between 14-19 years) were overweight or obese [6].

The university pays great attention to students' participation in physical and fitness activities. University sport is a significant factor in shaping a student's social, psychological, physical, and mental representations, so physical activity positively impacts a student's personality in a university. Also, University sport is one of the most important activities or hobbies that students accept. Therefore, health and physical fitness is a compulsory course for preparatory year female and male students in some colleges of Hafr Al-Batin University. Also, the university has a deanship of student affairs that

\*Corresponding author e-mail: [drzuhair@uhb.edu.sa](mailto:drzuhair@uhb.edu.sa)

offers intramural competitions among students and participates in a few intercollegiate sports. Unfortunately, physical activity decreased when students moved from high school to university. More than 90% of high school students participated in regular moderate and vigorous activity, while only 58% of college students participated [7].

Researchers conducted a study to measure the level of physical activity and barriers to participation in physical activity among medical college students at King Khalid University. They reported that 58% of participants were physically inactive, 15% of students had moderate physical activity, and 13% of students had high physical activity. Also, they indicated that the most significant barriers to not being physically active were time limitation, lack of accessibility, and lack of safe sports and places [8]. In addition, Sul-toni and Suherman [9] conducted a study to determine the reasons that prevented university students from being physically active. The study showed that students with lower levels of physical activity have a higher barrier to social influence when compared with students with moderate physical activity. Also, there was a significant difference between students with low and vigorous physical activity levels. Students with a low level of physical activity had more barriers to social influence and lack of willpower than those with vigorous physical activity.

Furthermore, Rodenbaugh [10] conducted a study to determine the barriers to being physically active. The researcher found that lack of transportation, safety concerns, and poor supporting infrastructure were the most significant barriers to physical activity at the University of Akron. Also, researchers ranked barriers to physical activity in this order: time limitation, lack of accessible and suitable sports place, lack of safe sporting place, lack of support and encouragement from others, and lack of friends to encourage me, respectively [11]. Likewise, a researcher ranked external barriers to participating in physical activity in order: not enough time, no one to exercise with, and lack of facilities [12]. Moreover, researchers found that female university students did not participate in physical activity because of lack of time, transport problems, expensive sports clubs, and lack of facilities at the university [13]. Finally, DiSerio [14] conducted a study to examine the barriers to physical activity for university students. The researcher found that the highest barriers to physical activity participation were lack of power, lack of energy, and social influence. In addition, there were significant differences between male and female university students in those barriers.

This study aimed to determine the level of physical activity and the effect factors that prevent university male and female students from participating in physical activities. Thus, the research questions included the following: (1) Do the differences in the means of barriers to being physically active among the level of physical activity differ between male and female university students? (2) Do male and female university students differ in barriers to being physically active? (3) Do students who participate or did not participate in physical activity after college differ in barriers to being physically active?

## 2 Methods

### 2.1. Participants

Six hundred and eight students from the University of Hafr Al Batin in Saudi Arabia participated in the study. Male students were 263, and female students were 345 from four university branches. The participants were 18 – 24 years of age ( $M = 19.5$ ,  $SD = 1.33$ ) and studied in their first-year preparation and college. Two hundred four students had low physical activity on the International Physical Activity Questionnaire short form (IPAQ-SF), 254 had moderate physical activity on the IPAQ-SF, and 150 students had a high level of physical activity on the IPAQ-SF. Data were collected using stratified random sampling because the study included different genders. The selection of participants was based on Health and Fitness courses, and their consent was the voluntary response to the questionnaires. The descriptive statistics of the participants are presented in Table 1.

### 2.2. Measurement

The measurement instrument included personal information, the International Physical Activity Questionnaire short form (IPAQ-SF), and the Barriers to Being Active Quiz (BBAQ). The personal information section included participants' gender, college, age, and whether or not students participate in physical activity after school. The instrument used to examine the level of students' participation in physical activity was IPAQ-SF. The questionnaire asked participants about the time they spent physically active last seven days. The IPAQ-SF had four generic items, including vigorous-intensity activity, moderate-intensity activity, walking, and sitting, to know whether students had low, moderate, or high levels of physical activity.

"Respondents were then classified into groups (high, moderate, and low physical activity) based on the following criteria:

1. High physical activity – three or more days of vigorous physical exercise, including at least 1,500 MET- -minutes/week, or seven or more days of any combination of vigorous exercise, moderate exercise, and walking that exceeded 3,000

MET-minutes/week.

2. Moderate physical activity – three or more days of vigorous physical exercise (at least 20 minutes per day), five or more days of moderate exercise or walking (at least 30 minutes per day), or five or more days of a combination of vigorous exercise, moderate exercise, and walking that exceeded 600 MET-minutes/ week.

3. Low physical activity – little physical activity that failed to comply with moderate or high physical activity classifications (less than 600 MET-minutes/week)." [15]. The IPAQ-SF seems valid and reliable because it was tested across 12 countries in different languages, and the Arabic language was one of them in 2005 [16].

The last section was the Barriers to Being Active Quiz (BBAQ), which contains 21 items on a four Likert scale (3= very likely, 2= somewhat likely, 1= somewhat unlikely, 0= very unlikely). Thus, the total scores range from 0 – 63 for overall barriers. After scores were calculated, the items were divided by 21 to get a range from 0-3. A score of three indicated high barriers that prevent students from participating in physical activity. In contrast, a score of zero shows students do not face any barriers to participating in physical activity.

Moreover, the BBAQ contains seven categories: social influence, lack of time, lack of energy, lack of willpower, fear of injury, lack of skill, and lack of resources. Each category consists of 3 items, so the total score ranges from 0-9, and they each were divided by three to obtain a range from 0-3. Therefore, the BBAQ seems to be a valid and reliable instrument for evaluating barriers to being physically active. The researcher found that the test for BBAQ (21 items) resulted in a coefficient alpha score of 0.87, indicating good internal consistency reliability. Also, factor analysis was conducted for validation of the BBAQ. All seven categories had a range of loading between 0.87 to 0.64. Therefore, it seems that the BBAQ measures one construct for barriers to being active.

2.3. Procedures

This study was conducted at the University of Hafr Al Batin in the Eastern Province of Saudi Arabia. All participants were selected from Health and Physical Fitness Classes. Around 1600 male and female students took these classes and were asked if they would be willing to respond to the questionnaire. Six hundred and sixty-three students consented to participate in the study. After the (PI) received consent from these students, the PI mailed out the questionnaire to the participants. After that, the PI collected the questionnaire, and more than 92% of students completed the study (608 out of 663 questionnaires). The questionnaire took around 20 minutes.

2.4. Data Analysis

The SPSS Statistics 23 was utilized to analyze the data and descriptive statistics to measure personal information and outcome measures for the study variables. A two-way ANOVA test was conducted to determine the effect of level of physical activity and gender on barriers to being physically active. Also, independent t-tests were conducted to examine the impact of male and female students and their participation in physical activity after college on seven categories of barriers to being physically active. Statistical significance was set at  $P < .05$ .

3 Results

The sample consented of 608 students who were between 18 and 24 years. They studied at the University of Hafer Al-Batin in four branches: Hafer Al-Batin, Alnayriah, Alkhji, and Quria Aulia. Approximately 57% of participants were female college students, and 43% were male. Forty-one percent participated in physical activities after college, while 59% of them did not participate in physical activity after college. Moreover, approximately 33% of participants had low physical activity, 42% of college students had moderate physical activity, and 25% had high physical activity. (See Table 1).

**Table 1:** Demographic Characteristics of Participants

Variables	Frequency	Percentage
Gender		
Male	263	43.3
Female	345	56.7
Level of Physical Activity		
Low	204	33.6
Moderate	254	41.8
High	150	24.7
Participation in PA		

	Yes	246	40.5
	No	362	59.5

**Research question 1.** Do the differences in the means of barriers to being physically active among the level of physical activity differ between male and female college students?

A two-factor  $2 \times 3$  ANOVA (gender  $\times$  levels of physical activity) was conducted to evaluate the effect of male and female students and their level of physical activity on barriers to being physically active. The two independent variables in this study were gender and physical activity levels (High, moderate, and low). The dependent variable was barriers to being physically active, with higher scores indicating higher barriers ( $M = 1.36$  out of a possible 3 points,  $SD = 0.58$ ). The means and standard deviations for barriers measured as a function of the two factors are presented in Table 2.

**Table 2:** Means and Standard Deviations of Barriers to Being Physically Active

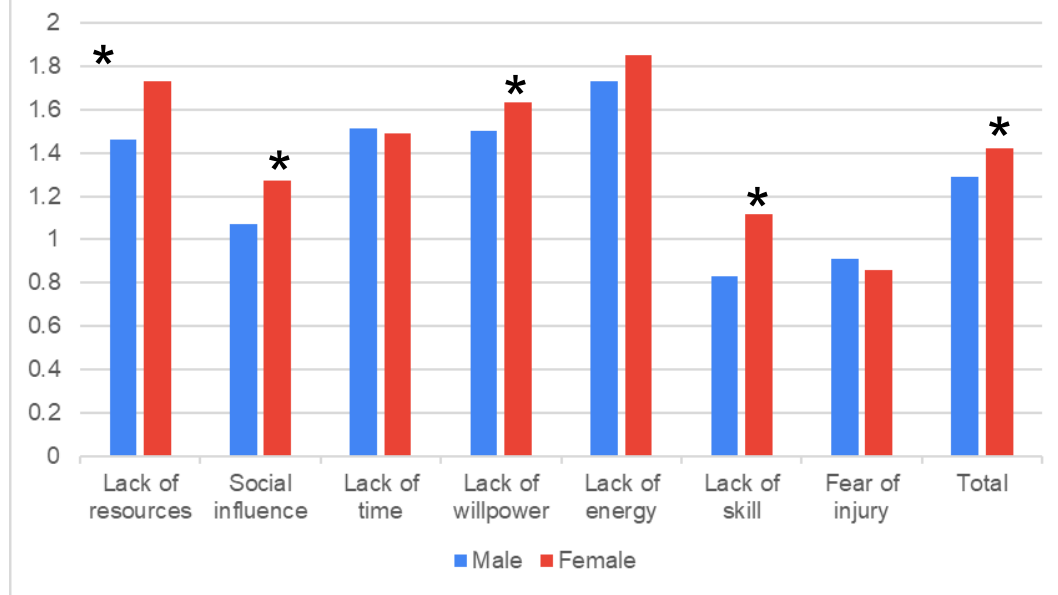
Gender	Levels of Physical Activity	<i>n</i>	<i>M</i>	<i>SD</i>
Male	Low	78	1.48	.49
	Moderate	106	1.26	.53
	High	79	1.15	.55
	Total	263	1.29	.54
Female	Low	126	1.63	.60
	Moderate	148	1.34	.54
	High	71	1.21	.61
	Total	345	1.42	.60
Total	Low	204	1.57	.57
	Moderate	254	1.31	.54
	High	150	1.18	.58
	Total	608	1.36	.58

The results for the two-way ANOVA indicated no significant interaction between gender and level of physical activity,  $F(2, 602) = .341, p = .711$ , partial  $\eta^2 = .001$ , but showed significant main effects for gender,  $F(1, 602) = 4.55, p = .033$ , partial  $\eta^2 = .008$ , and levels of physical activity,  $F(2, 602) = 21.50, p < .001$ , partial  $\eta^2 = .067$ . The gender main effect indicated that female university students ( $M = 1.42, SD = .60$ ) had more significant barriers to being physically active than male university students ( $M = 1.29, SD = .54$ ). To control for Type I error across the pairwise comparison for levels of physical activity, alpha for each was set at .017 (.05/3) by using Bonferroni approach. The results of levels of physical activity indicated that barriers to being physically active for students who had low physical activity ( $M = 1.57, SD = .57$ ) were significantly higher than for students who had moderate,  $F(1, 605) = 44.14, p < .001$ , partial  $\eta^2 = .068$ , and high physical activity,  $F(1, 605) = 26.60, p < .001$ , partial  $\eta^2 = .042$ . However, students with moderate physical activity did not significantly differ from those with high physical activity,  $F(1, 605) = 4.98, p = .026$ , partial  $\eta^2 = .008$ . (See Table 2).

**Research question 2:** Do male and female university students differ in seven barrier categories to being physically active?

Participants were asked to respond to the BBAQ, which contains seven categories, to know what most barriers they faced to not being physically active. Female college students ranked their barrier to being active in this order: lack of energy ( $M = 1.85$ ), lack of resources ( $M = 1.73$ ), lack of willpower ( $M = 1.63$ ), lack of time ( $M = 1.49$ ), social influence ( $M = 1.27$ ), lack of skill ( $M = 1.12$ ), and fear of injury ( $M = .86$ ). However, male college students ranked their barriers to being physically active in this order: Lack of energy ( $M = 1.73$ ), lack of time ( $M = 1.51$ ), lack of willpower ( $M = 1.50$ ), lack of resource ( $M = 1.46$ ), social influence ( $M = 1.07$ ), fear of injury ( $M = .91$ ), and lack of skill ( $M = .83$ ).

Independent t-tests were conducted for seven barrier categories to compare female and male students who had more barriers to being active. The results indicated that female students had more barriers to being active than male students in four barriers categories that were lack of resources, social influence, lack of willpower, and lack of skill,  $t(606) = 4.12, p < .001$ ;  $t(606) = 3.30, p = .001$ ;  $t(606) = 2.07, p = .039$ ;  $t(606) = 4.26, p < .001$ , respectively. (See Figure 1 & Table 3).

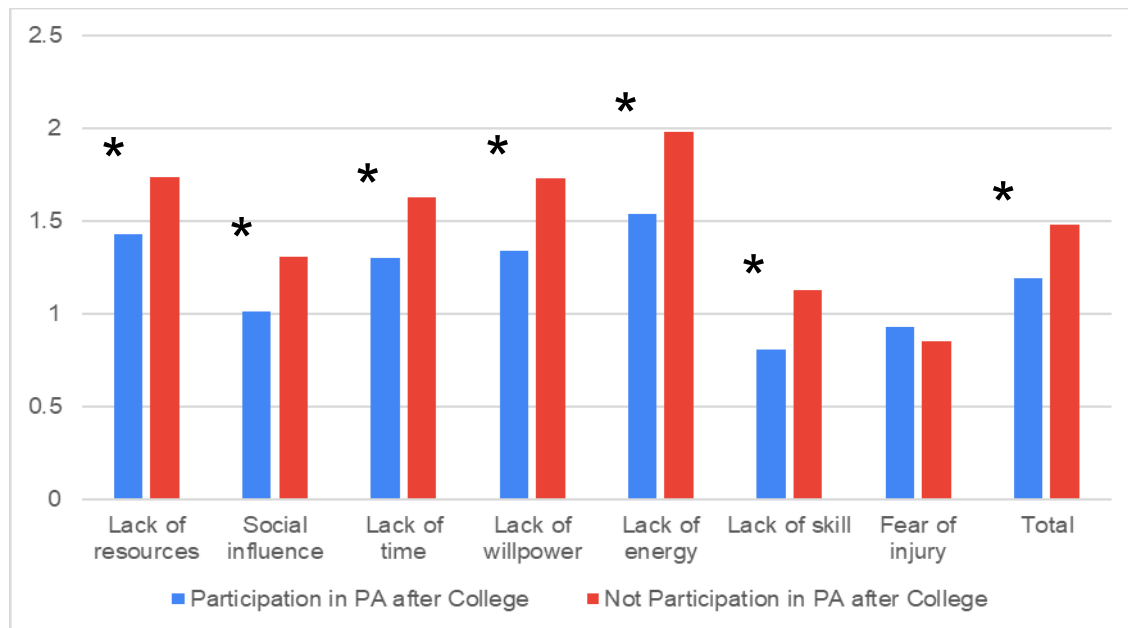


\*  $p < .005$

**Fig. 1.** Means for Comparisons of barriers to being active by Gender

**Research question 3:** Do students who participate or did not participate in physical activity after college differ in barriers to being physically active?

Independent t-tests were conducted to evaluate the effect of students who participated or did not participate in physical activity after college in seven barrier categories to being physically active. The results indicated that students who participate in physical activity after college had less barriers to being active than students who did not participate in physical activity in six barrier categories that were lack of resources, social influence, lack of willpower, lack of energy, lack of time, and lack of skill,  $t(606) = 4.70, p < .001$ ;  $t(606) = 5.05, p < .001$ ;  $t(606) = 6.49, p < .001$ ;  $t(606) = 6.61, p < .001$ ,  $t(606) = 5.26, p < .001$ ,  $t(606) = 4.69, p < .001$ , respectively. (See Figure 2 & Table 3).



\*  $p < .005$

**Fig. 2.** Means for Comparisons of barriers to being active by Student Participation in PA After College

**Table 3:** Means for Comparisons of barriers to being active by Gender, Student Participation in PA After College, and Levels of Physical Activity

Barriers categories	Gender		Participation		Physical Activity Levels			Total
	Male	Female	Yes	No	Low	Moderate	High	
Lack of resources	1.46	1.73	1.43	1.74	1.78	1.57	1.46	1.61
Social influence	1.07	1.27	1.01	1.31	1.40	1.11	1.01	1.18
Lack of time	1.51	1.49	1.30	1.63	1.74	1.40	1.33	1.50
Lack of willpower	1.50	1.63	1.34	1.73	1.85	1.51	1.32	1.57
Lack of energy	1.73	1.85	1.54	1.98	2.06	1.74	1.55	1.80
Lack of skill	0.83	1.12	0.81	1.13	1.27	0.93	0.74	1.00
Fear of injury	0.91	0.86	0.93	0.85	0.92	0.87	0.83	0.88
Total	1.29	1.42	1.19	1.48	1.57	1.31	1.18	1.36

#### 4 Discussion of Findings

Physical inactivity is a significant health problem in university students. The present study was designed to determine the level of physical activity and obstacles preventing male and female university students from participating in physical activities. Past studies have identified several reasons for university students not participating in physical activity, such as lack of resources, time, and willpower. In general, the finding of this study indicated that most university students had a moderate level of physical activity (41.8%). The current study was consistent with several previous studies that detected that university students had a moderate level of physical activity [11, 15, 17]. Also, the results of this study showed that the most significant barriers that prevented participation in physical activity were lack of energy ( $M= 1.80, SD= 0.82$ ), lack of resources ( $M= 1.61, SD= 0.79$ ), lack of willpower ( $M= 1.57, SD= 0.76$ ), and lack of time ( $M= 1.50, SD= 0.79$ ).

The first finding of this study found that female university students had more barriers to being physically active than male university students. The current finding agrees with a previous study [18]. Moreover, this study found that university students with low physical activity had more barriers to being physically active than university students with moderate and high physical activity. Previous studies confirm that university students with a low level of physical activity had more barriers that hinder being physically active [9, 14, 19]. Our results suggest that because some university students did not reach the recommendation of physical activity level, they lacked awareness of sports programs, and they did not know how to perform specific exercises or recreational activities and felt the university lacked enough sports facilities.

The second research question indicated significant barriers between male and female university students. Female university students had more barriers (lack of resources, social influence, lack of willpower, and lack of skill) to participating in physical activity than male university students. The highest barriers that were rated across all participants were lack of energy, lack of resources, lack of willpower, and lack of time. Moreover, in the ranking of barriers, male university students rated barriers in order: lack of energy, lack of time, lack of willpower, and lack of resources, and female university students ranked barriers in order: lack of energy, lack of resources, lack of willpower, and lack of time. These results are similar to a study on university students [14]. This means universities should establish sports facilities and encourage students to participate in physical activity through training programs and competitive and recreational sports.

The finding of the third research question indicated that university students who participated in physical activity after college had fewer barriers that hindered them from participating in physical activity than students who did not participate in physical activity after college. The most reasons that prevented students not participating in physical activity after college were lack of energy, lack of resources, lack of willpower, and lack of time. Different studies confirm that physically inactive students had more barriers to physical activity participation than physically active students, especially in terms of lack of time, resources, and energy [8, 11]. This result suggests that physically inactive students need more knowledge and awareness about the interest of participating in physical activity. Therefore, the university should promote indoor and outdoor recreational and sports activities to increase physical activity among university students.

#### 5 Conclusion

This study evaluated the level of physical activity and barriers that hinder university students from participating in physical activity. In general, the results of this study show that most university students participate in moderate physical activity, and students who had a low level of physical activity had exposed to more barriers to participating in physical activity. Also, the study shows that female students had more barriers to preventing physical activity participation than

male students. Overall, lack of energy, lack of resources, lack of willpower, and lack of time were the most highly rated barriers. Thus, according to the results of this study, the researcher provides recommendations for reducing the barriers to participating in physical activity: (1) Universities should provide competitive, recreational, and leisure activities for male and female students and establish sports facilities for full range sports such as soccer, volleyball, track and field, badminton, and tennis. (2) Universities should offer suitable activities or sports such as aquatic activities, fitness centers, group and individual sports, and self-defense sports and should hold regular training programs, intramural competitions, and sports clubs. (3) Universities should have strategies to spread awareness and sports culture. To illustrate, the deanship of student affairs should conduct sports and activities to increase students' knowledge of the importance of sports and invite the media to conduct educational sports programs on the university campus. (4) universities should also create a rental center for indoor and outdoor activities that allow students to rent adventure and enjoyable equipment such as camping gear, cycling, hiking, and backpacking.

There is one limitation in our study that was conducted only at the Hafer Al-Batin University, and this study's participants were a particular sample attending the physical fitness class. Therefore, this study's results cannot be generalized to all Saudi Arabian universities.

Finally, the researcher concludes that understanding the barriers to preventing being physically active helps consider and solve them in order to reach the WHO's recommendation for physical activity. Also, this study's results should significantly contribute to helping universities and public health organizations develop and increase physical activity participation.

### Conflict of interest

The authors declare that there is no conflict regarding the publication of this paper.

### References

- [1] WHO. *Physical activity*. World Health Organization. Geneva, Switzerland, (2020).
- [2] Alqahtani, B. A., Alenazi, A. M., Alhowimel, A. S., & Elnaggar, R. K. The descriptive pattern of physical activity in Saudi Arabia: Analysis of national survey data. *International Health*, 13(3), 232-239, (2021).
- [3] WHO. *Obesity and overweight*. World Health Organization. Geneva, Switzerland, (2021).
- [4] Ng, M., Fleming, T., Robinson, M., Thomson, B., Graetz, N., Margono, C., ... & Abraham, J. P. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: A systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 384, 766-781, (2014).
- [5] Al Dhaifallah, A., Mwanri, L., & Aljoudi, A. Childhood obesity in Saudi Arabia: Opportunities and challenges. *Saudi Journal of obesity*, 3(1), 2-7, (2015).
- [6] Al-Hazaa, H. M., Abahussain, N. A., Al-Sobayel, H. I., Qahwaji, D. M., Alsulaiman, N. A., & Musaiger, A. O. Prevalence of overweight, obesity, and abdominal obesity among urban Saudi adolescents: Gender and regional variations. *Journal of health, population, and nutrition*, 32(4), 634-645, (2014).
- [7] Kilpatrick, M., Hebert, E., & Bartholomew, J. College students' motivation for physical activity: differentiating men's and women's motives for sport participation and exercise. *Journal of American college health*, 54(2), 87-94, (2005).
- [8] Awadalla, N. J., Aboelyazed, A. E., Hassanein, M. A., Khalil, S. N., Aftab, R., Gaballa, I. I., & Mahfouz, A. A. Assessment of physical inactivity and perceived barriers to physical activity among health college students, south-western Saudi Arabia. *East Mediterr Health J*, 20(10), 596-604, (2014).
- [9] Sultoni, K., and Suherman, A. *Barriers to physical activity on university student*. In IOP Conference Series: Materials Science and Engineering, Bandung, Indonesia, (2016).
- [10] Rodenbaugh, T. A. *The barriers and facilitators to physical activity on campus: An analysis of UA PhotoVoice research*. (2016).
- [11] El Gilany, A. H., Badawi, K., El Khawaga, G., & Awadalla, N. Physical activity profile of students in Mansoura University, Egypt. *EMHJ-Eastern Mediterranean Health Journal*, 17(8), 694-702, (2011).
- [12] Manaf, H. Barriers to participation in physical activity and exercise among middle-aged and elderly individuals. *Singapore Med J*, 54(10), 581-586, (2013).



- 
- [13] Nxumalo, S. A., & Beetge, R. Sport participation of female university students. *South African Journal for Research in Sport, Physical Education and Recreation*, 39(2), 163-179, (2017).
- [14] DiSerio, A. M. *Barriers to physical activity in university students referred to an exercise is medicine on campus program*. Doctoral dissertation, Illinois State University, (2021).
- [15] Bednarek, J., Pomykała, S., Bigosińska, M., & Szygula, Z. Physical activity of Polish and Turkish university students as assessed by IPAQ. *Central European Journal of Sport Sciences and Medicine*, 16(4), 13-22, (2016).
- [16] IPAQ Research Committee. *Guidelines for data processing and analysis of the International Physical Activity Questionnaire (IPAQ)-short and long forms*. Retrieved from <http://www.ipaq.ki.se/scoring.pdf>. (2005).
- [17] Kim, C. H., Song, Y. E., & Jeon, Y. J. The effect of college students' physical activity level on depression and personal relationships. *Healthcare Journal*, 9(5), 526- 537, (2021).
- [18] Gómez-López, M., Gallegos, A. G., & Extremera, A. B. Perceived barriers by university students in the practice of physical activities. *Journal of sports science & medicine*, 9(3), 374- 381, (2010).
- [19] Sevil, J., Praxedes, A., Abarca-Sos, A., Del Villar, F., & Garcia-Gonzalez, L. Levels of physical activity, motivation and barriers to participation in university students. *The Journal of sports medicine and physical fitness*, 56(10), 1239-1248, (2015).