



Barriers to exercise uptake among female medical students: a cross-sectional study

Dr Eman Alkhalawi

Department of Family and Community Medicine, Faculty of Medicine in Rabigh, King Abdulaziz University, Jeddah, Saudi Arabia

Abstract

Objectives: This study investigates physical activity levels and perceived barriers among female medical students at King Abdulaziz University. It explores the association between these barriers and students' self-reported physical activity.

Methodology: Data were collected via a web-based questionnaire from 301 students between November and December 2022. The questionnaire assessed demographic characteristics, physical activity using the International Physical Activity Questionnaire (IPAQ), and perceived barriers to exercise using the Exercise Benefits and Barriers Scale (EBBS). Association between physical activity and barriers was examined using the unpaired t-test.

Results: Only a third of the participants engaged in moderate to vigorous physical activity on at least three days in the past week. Practical, financial, and logistical barriers—such as cost, time constraints, and limited exercise facilities—were the most frequently cited barriers to physical activity, with over 70% of students agreeing or strongly agreeing with these challenges. Physically active students reported a higher mean barrier score (37.1) than those who were not active (33.8), suggesting that they were more aware of the barriers they faced. Social barriers had a lower impact on the students' physical activity. However, at least 20% of participants agreed with each item on the barrier scale, indicating the need to consider a wide range of factors when designing interventions to promote physical activity among this population.

Conclusion: tailored interventions are necessary to address both logistical and social barriers to physical activity among this population. Affordable and accessible exercise facilities, with student involvement in planning, could support and sustain physical activity.

Keywords: Physical activity; women; Saudi Arabia

Introduction

Physical activity is defined as “any bodily movement produced by skeletal muscles that requires energy expenditure”. This includes all movement including during leisure time, for transport, or that related to work or domestic activities. Higher levels of physical activity lead to health benefits and reduction in the risk of several non-communicable diseases (e.g., hypertension, cardiovascular disease, cancer, anxiety and depression). Among adolescence and young adults, it reduces the risk of overweight and obesity, and improves pro-social behavior and sleep.(1) Physical inactivity ranks the fourth among risk factor for mortality, contributing to 7% of deaths globally.(2) It is defined as an insufficient level of physical activity that does not meet recommendations of the World Health Organization (WHO) that adults should aim for at least 150-300 minutes per week of moderate intensity aerobic activity, or at least 75 min of vigorous intensity aerobic activity, or an

corresponding combination of moderate and vigorous intensity activities.(3)

In many parts of the world, urbanization has led to a shift from active to sedentary jobs and transport. In addition, environmental barriers such as traffic, low air quality, and lack of safe and suitable places to exercise, that have contributed to inactivity.(1, 4)

While studies on attitudes towards exercise mostly highlight perceived health benefits, medical students have pointed to the added benefit of stress-relief.(5, 6) Physically active students have better grades, school attendance, cognitive performance, and classroom behavior.(7, 8)

However, medical students in the UK and USA reported barriers to exercise such as cost, lack of time, lack of availability and inconvenient schedules of exercise facilities.(5, 6) Such barriers may differ widely between populations according to context and age. For example, among older adults in Germany (aged ≥ 65 years), the three most frequently cited barriers were poor health, lack of company, and lack of

interest. Women more frequently mentioned lack of opportunities for sports or leisure activities and lack of transport than men.(9) A systematic review reported high prevalence of inactivity in Saudi Arabia among all age groups, especially among females. This was attributed to women having less access to exercise facilities, low self-efficacy, lack of social support and less opportunities to participate in sport.(10) This poses a major public health challenge and puts women at risk for several noncommunicable diseases including obesity, which currently affects 44% of women in Saudi Arabia.(11)

Despite their awareness of its value, female medical students may face multi-layered barriers to physical activity, those related to their high-demand studies on the one side, and social barriers that are faced by women in many settings on the other. Thus, the aim of this study is to provide an understanding of the barriers female medical students in Saudi Arabia may encounter to physical activity, and explore the association between these barriers and self-reported physical activity levels.

Gaining insights into the barriers impeding physical activity among female medical students can be instrumental in designing interventions to promote and facilitate physical activity among this population.

Objectives

- To describe general levels of physical activity of female medical students at King Abdulaziz University.
- To identify perceived barriers to exercise among female medical students at King Abdulaziz University.
- To explore the association between perceived barriers to exercise in students that are physically active compared to those who are not.

Material and methods

Participants

This cross-sectional study was conducted through a web-based questionnaire that was disseminated amongst female medical students at King Abdulaziz University in Jeddah City through each year leader through commonly used digital channels. Responses were collected between 1 November and 30 December 2022. Ethical approval was obtained from King Abdulaziz

University ethical committee (Reference No 342-22). Informed consent was obtained from all participants by accepting to participate in the online survey before its start. Participants were informed of their right to withdraw their consent at any time. Participants consented to take part in the study by selecting a checkbox at the beginning of the questionnaire.

Measures

An online self-administered questionnaire contained three sections:

Section 1: Demographic characteristics of the participants (age, year of medical school, marital status, number of children, city of residence).

Section 2: Questions on physical activity were adapted from the International physical activity questionnaire short form (IPAQ-short form).(12) Levels of physical activity were elicited by asking participants to give the number of days they engage in vigorous (for example, heavy lifting, digging, aerobics, or fast bicycling) or moderate intensity physical activity (for example, carrying light loads, bicycling at a regular pace, or doubles tennis) during the past seven days. Students that engaged in vigorous or moderate levels of physical activity on at least three days during the past seven days were considered “physically active”. While those with less than three days of moderate to vigorous activity were designated “not physically active”.

Section 3: Exercise benefits and barriers scale questionnaire (EBBS). The 14 barrier scale items which have been validated to use alone were used to assess barriers to physical activity. The EBBS questionnaire has four-responses on a Likert scale, SA (Strongly agree), A (Agree), D (Disagree), SD (Strongly disagree), and a score is reported for each participant on a continuous scale, ranging between 14 and 56, 14 being the lowest level of perceived barriers to physical activity and 56 being the highest level of perceived barriers (strongly agree with all barriers).(13)

Analysis

Demographic variables, physical activity, and perceived barriers to physical activity are described as the mean and standard deviation for continuous variables and frequency and percent for categorical variables. *Mean levels of the perceived barriers to physical activity* were compared between students who were physically

active versus those who were not physically active using the unpaired t-test. A P-value of <0.05 was considered a statistically significant difference between groups. Statistical analysis was carried out using Stata SE version 18.

Results

A total of 301 female medical students participated in the study. The mean age of Table 1: Characteristics of the participants (n = 301).

	Range	Mean	SD
Age	19-27	22.5	1.6
Physical activity barrier scale	19-56	35	7.4
	Frequency	%	
Study year			
	2 nd year	39	12.9
	3 rd year	50	16.6
	4 th year	50	16.6
	5 th year	105	34.8
	6 th year	57	18.9
Marital status			
	Single	260	13.6
	Married	41	86.3
Children			
	Yes	15	4.9
	No	286	95
Residency Place			
	Jeddah	299	99.3
	Rabigh	1	0.3
	Bahrah	1	0.3
Physically active*			
	Yes	106	35.2

*Students who reported moderate or vigorous physical activity on three days or more in the past seven days.

the participants was 22.5 years (SD= 1.6). Most respondents were in the fifth medical year. Just over one third of the students were physically active (n = 106). The lowest reported physical activity barriers score in the population was 19 and the highest score was 56 (Table 1).

The most frequently perceived barriers to physical activity to which participants agreed or strongly agreed are those related

to cost, time, and place to exercise. Over 70% of students agreed or strongly agreed that exercise costs too much, that it consumed too much of their time, and that there are too few places to exercise (figure 1).

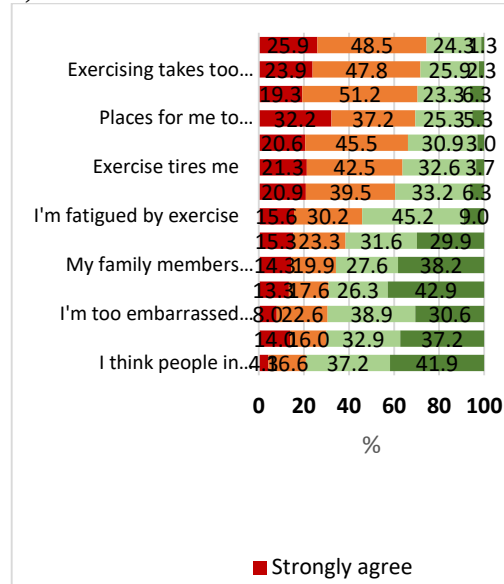


Figure 1: Percentage of respondents for each response and item of the exercise barrier scale questionnaire (n=301).

Table 2: Difference in the exercise barrier scale between students who were and were not physically active (n=301).

Physically active	Mean exercise barrier score	Standard deviation	T-Value	P-Value*
Yes	37.09	8.54	-3.7171	0.0002
No	33.83	6.46		

*Unpaired t-test

Discussion

Among this sample of female medical students, physical activity levels were generally low with only one third reporting moderate to vigorous physical activity on at least three days in the past week. Practical, financial and logistical barriers, rather than physical or social barriers, were the most frequently given perceived barriers to physically activity. Social barriers, such as embarrassment or lack of family support had the least perceived impact. This was consistent with a study among female university students in health colleges in Riyadh.(14) others also highlighted practical barriers such as lack of time and resources in the general female population.(15, 16) Nonetheless, at least 20% of participants

Interestingly, the physically active students had a higher mean barrier score to exercise (37.1) compared to students with low or no physical activity (33.8), (p-value=0.0002) (table 2).

agreed or strongly agreed with each item in the barrier questionnaire, reflecting that all these factors should be considered when designing interventions to support physical activity. Studies among the general population point to a higher impact of cultural norms, gender roles and lack of support as a determinant of women's physical activity.(17, 18)

The study explored barriers to physical activity in a defined group of young, female medical students. The demanding study load of medical students may have contributed to their perception of time and distance hindering their ability to be physically active. On the other hand, higher educational level may have contributed to the lower level of social barriers. These may not reflect the perception of the general population. But given the shared time and

place for this population of female medical students, and their need to counteract the physical and mental demand of their study years and future jobs, they may benefit from tailored interventions for their context and setting.

Contrary to what is expected, students that were physically active reported a higher mean exercise barrier score than those who were not active. A possible explanation for this is that those who make an effort to exercise are faced by barriers and are therefore more aware of them.

The cross-sectional design of the study may have resulted in inaccurate recall of physical activity, and inquiring about physical activity in the past seven days may not represent students' long-term habits. However, this type of error is expected to occur randomly and therefore not bias results. Future studies using activity monitors may contribute to more accurate measurement of physical activity levels.

Conclusion

Given the high level of inactivity in the Saudi population, especially amongst women, and its resulting health consequences, it is crucial to design public health interventions that address existing barriers and perhaps tailor these to the needs of various groups. Based on the findings of a strong perception of logistical barriers to exercise among female medical students, affordable and accessible exercise facilities should be made available. Personal and social barriers should also be addressed. Students should be engaged in the planning of such interventions to design impactful interventions.

We did not find the expected association between the exercise barrier scale and lack of physical activity. However, given that even those who reported being physically active had a high average perception of barriers, addressing these barriers could help sustain and support those who are already physically active, while encouraging those who are not. Regular monitoring and follow-up of physical activity levels would help assess the impact of interventions.

List of abbreviations:

IPAQ-short form: International physical activity questionnaire short form.

EBBS: Exercise benefits and barriers scale questionnaire

Ethics approval and consent to participate

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the King Abdulaziz University Ethical Committee (Reference No. 342-22). All participants provided informed consent prior to inclusion, and confidentiality was strictly maintained. The aims of the study, use of data, and right to withdraw were explained in written form at the beginning of the survey. Informed consent was obtained from all participants by checking a consent box accepting to participate in the online survey before starting.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The author declares that they have no competing interests.

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Authors' contributions

EA: Conceptualisation, design, data collection, analysis and writing of the manuscript.

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