

Original Article

Physical activity and its determinant factors among medical students of Kerman University of Medical Sciences

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Accepted for publication: 18 Jan 2018

Abstract

Background: Exercise can play an important role in preventing chronic diseases. Given the key role of medical students on public health behaviors, the aim of the present study was to assess physical activity and factors influencing it in medical students of Kerman University of Medical Sciences.

Methods: The present cross-sectional study was conducted on 600 medical students of Kerman University of Medical Sciences, using census method, over a six-month period. The valid and reliable self-administrated international physical activity questionnaire was used. Relevant data were fed into IBM SPSS Statistics for Windows, Version 20.0. The data were analyzed using chi-square test, ANOVA and multinomial logistic regression.

Results: The level of physical activity was low in 275 (53.1%), moderate in 187 (36%), and vigorous in 57 (10.9%) of the participants. Students whose mothers or fathers had freelance jobs were 0.38 ($P=0.005$) or 0.54 ($P=0.033$) times less likely to have moderate physical activity compared with those whose mothers or fathers were retired. Students whose fathers had 'lower than diploma' education were 3.15 times more likely to have moderate physical activity ($P=0.003$). Comparing vigorous to low physical activities, students whose fathers were in governmental jobs were 3.15 times more likely to have vigorous physical activity ($P=0.036$). Also, students whose fathers had 'lower than diploma' education level were 0.17 times less likely to have vigorous physical activity ($P=0.004$).

Conclusion: Medical students in Iran are not in a good status in terms of physical activity. Considering the decisive role of parents in their children's attitudes towards physical activity, even in college, parent training seems necessary.

Keywords: Cross-Sectional Studies; Exercise; Medical; Risk Factors; Students

Cite this article as: Danaei M, Momeni M, Sheikhshoei M, Khalooei A. Physical activity and its determinant factors among medical students of Kerman University of Medical Sciences. SDH. 2018;4(1):36-43 DOI: <http://dx.doi.org/10.22037/sdh.v4i1.17652>

Introduction
Chronic diseases are the main cause of death in the world and it is estimated that by 2020 these diseases will

account for about 60% of the disease burden (1, 2). Noncommunicable diseases caused 236 thousand deaths in Iran in 2013

, and over the past 20 years, there has been a 14.5% increase in the deaths caused by chronic diseases (3). Recently, several studies have shown that an unhealthy lifestyle, especially at a young age, plays an important role in the development of cardiovascular diseases as well as other chronic diseases. Exercise can play an important role in preventing many chronic diseases (4-7). Injuries and ischemic heart diseases were the main causes of death in the 15-49-year-old population in Iran. The main risk factors in this age group were inappropriate dietary habits, high blood pressure, overweight and obesity, inadequate physical activity, and smoking (8).

Following a healthy lifestyle, medical students, as the youth of today and doctors of tomorrow, can effectively contribute to building a better future for the people of a country, because by having enough physical activity, they can be a good example for patients and they will be more likely to recommend appropriate physical activities to the patients (1, 9). In some studies, conducted in developed countries, a large percentage of medical students had good physical activity (4, 10, 11), while the results of various studies on medical students in Iran suggest high prevalence of unhealthy behaviors and insufficient physical activity among this group (10). A study carried out on health behaviors of medical students in Shiraz showed that less than 10% of the students had proper physical activity (1). In addition, a study carried out on medical students in Tabriz reported that about 40% of the participants had insufficient physical activity, and only about 6% had a good physical activity status (12).

Given the key role of medical students on public health behaviors of society and the importance of health-based behaviors for having a healthy and productive life, and since only limited studies have been conducted on this subject in Kerman, the aim of the current study was to assess physical activity levels and factors

influencing it in medical students of Kerman University of Medical Sciences, Iran.

Methods

A cross-sectional study was conducted in Kerman University of Medical Sciences between May and November 2016. All medical students in Kerman University of Medical Sciences were study population. A total of 600 medical students participated in the study but data of 519 students could be analyzed because 81 questionnaires were excluded during the analysis process. Medical students who were not available at the time of distributing the questionnaires in classrooms or in the hospitals were excluded.

After obtaining a permit and letter of introduction from the Research Council of Kerman University of Medical Sciences (Ethic code: IR.KMU.REC.1394.290), the questionnaires were distributed by the researcher among medical students in classrooms and different wards of the teaching hospitals over a six-month period. The questionnaires were distributed among the students during the daytime (morning till noon) when there was the possibility of finding more students. First, the participants were given a brief explanation about the necessity of research and verbal consent was obtained. Then, the students were asked to complete and return the questionnaire. In case of any ambiguity in answering questions at the time of completing the questionnaire, necessary explanations were given by the researcher and, once completed, the questionnaires were collected. In the present study, demographic variables, including gender, age, living status (living with family or living in dormitory), marital status, educational level, parental educational level, and parental occupation, were examined as independent variables. Also, the International Physical Activity questionnaire (IPAQ) was used in order to assess the status of physical activity as a dependent variable.

This questionnaire is reported to be a valid and reliable questionnaire among Iranian population (16). Physical activity in the past seven days was measured using IPAQ questionnaire.

After collecting the data, according to the questionnaire, the pattern and intensity of the activities were determined during the seven days prior to the day of the study. Activities such as aerobics, high-speed cycling, mountain climbing, and basketball, which burn more than six calories per minute, were considered as vigorous-intensity physical activity, and activities such as volleyball, badminton, and cleaning rooms, which burn three to six calories per minute were considered moderate physical activities. Calculation of energy intensity of total activities in the past seven days was performed according to the IPAQ instruction which is based on the Metabolic Equivalents (METs) unit. MET is defined as a level of activity in which a person burns 1 kcal/kg/hour. In this questionnaire, physical activity is divided into four areas of daily work, transportation, housework, and leisure. In addition, there was a section about the time spent in the sitting position, which measures the length of time a person spends sitting during a day at work or leisure time. In order to calculate MET for each area, people were asked questions regarding the number of days allocated to the activity in a week, the number of hours per day, and the number of minutes per day that the activity was performed. The number of hours for each person was multiplied by 60 and summed up with the number of seconds to obtain the duration of physical activity per day/min. Then, to obtain the total MET value, the number of minutes was multiplied by the number of days per week and by the intensity of activity with the MET value specified in the guidelines based on the type of activity. The MET value was calculated for every activity in each area. Then, the total MET for each area was calculated. The sum of the amounts of MET spent in different areas together represents the total number of

MET consumed per person per week. The total energy consumption between 0 and 599 met/min/week during the week was considered low physical activity, 600 to 3000 met/min/week was considered moderate physical activity, and energy consumption more than 3000 met/min/week was considered vigorous. According to the questionnaire guideline, if a person's activity is less than 10 minutes a day, physical activity is considered zero. People who reported more than seven days of activity per week and also those who had more than 960 minutes (16 hours) physical activity during the day were excluded because at least 8 hours of sleep per day was considered (21).

All data analysis was performed using IBM SPSS Statistics for Windows, Version 20.0. To analyze the data, descriptive statistics, chi-square test, one-way ANOVA, and multinomial logistic regression were used. The significance level was set as 0.05.

Results

A total of 600 students enrolled in the study. A total of 519 questionnaires were finally analyzed (response rate: 86.5%). The mean $\pm$ SD age of participants was 22.46 $\pm$ 2.04 years. The minimum and maximum ages of the participants were 19 and 30 years, respectively. Other demographic characteristics of participants are given in Table 1.

The mean $\pm$ SD score of physical activity in medical students was 1188 $\pm$ 1607 Met-min/week. The median physical activity level was 493 Met-min/week with Interquartile Range (IQR) of 1848 Met-min/week. The physical activity scores varied from a maximum of 8880 to a minimum of 0 Met-min/week. The results of descriptive statistics in different areas of physical activity are shown in Table 2.

Using the international physical activity questionnaire guideline, the amount of physical activity was divided into low, moderate, and vigorous. According to the results, the level of physical activity among

Table 1. Demographic characteristics of the study participants

Variable	N (%)
Gender	
Male	218 (42)
Female	301 (58)
Living condition	
Living with family	373 (78.4)
Living in dormitory	103 (21.6)
Marital status	
Single	354 (73.9)
Married	125 (26.1)
Education grade	
Basic Sciences	112 (23.2)
Physiopathology	109 (22.6)
Externship	129 (26.7)
Internship	133 (27.5)
Mothers' occupation	
Governmental job	131 (27.8)
Freelance job	17 (3.7)
Housewife	231 (49)
Retired	92 (19.5)
Fathers' occupation	
Government job	173 (36)
Freelance job	96 (20)
Retired	211 (44)
Mothers' Education	
≤12 years	181 (38.8)
12-16 years	234 (50.2)
≥16 years	51 (11)
Fathers' Education	
≤12 years	137 (29)
12-16 years	195 (41.2)
≥16 years	141 (29.8)

Table 2. The frequency of physical activity among medical students in different categories

Physical activity level	Low N (%)	Moderate N (%)	Vigorous N (%)
Work related	399 (77.3)	101 (19.6)	16 (3.1)
Transport	463 (91.7)	40 (7.9)	2 (0.4)
Domestic and gardening	414 (79.8)	97 (18.9)	1 (0.2)
Leisure time activity	455 (88.9)	50 (9.8)	7 (1.4)
Vigorous physical activity	461 (88.8)	47 (9.1)	11 (2.1)
Moderate physical activity	362 (71.1)	142 (27.9)	5 (1)
Walking	354 (70.5)	139 (27.7)	9 (1.8)
Total physical activity	263 (53.1)	178 (36)	54 (10.9)

Table 3. Multinomial logistic regression analysis of moderate and vigorous physical activity with low physical activity as the reference category

Variable		B	Moderate Odds ratio (95% CI)	P	B	Vigorous Odds ratio (95% CI)	P
Mothers' occupation	Governmental job	0.898	2.456 (0.641-9.405)	0.19	1.613	5.019(0.762-33.080)	0.094
	Freelance job	-	0.378 (0.192-0.747)	0.005	-	0.413(0.169-1.012)	0.053
	Housewife	0.972	-		0.883		
		1.651	0.192 (0.091-0.405)	<0.001	0.804	2.235 (0.832-6.001)	0.111
Fathers' occupation	Retired (ref)	-					
	Governmental job	0.138	0.871 (0.457-1.659)	0.674	1.148	3.151 (1.078-9.209)	0.036
	Freelance job	-	0.540 (0.307-0.951)	0.033	0.936	2.54 (1.079-6.026)	0.033
Mothers' Education	Retired (ref)	-					
	≤12 years	0.101	0.904 (0.294-2.782)	0.861	-	0.454 (0.130-1.578)	0.214
	12-16 years	0.373	1.452 (0.530-3.978)	0.469	0.453	0.636 (0.241-1.677)	0.360
Fathers' Education	≥16 years (ref)	-					
	≤12 years	1.148	3.151 (1.488-6.676)	0.003	-	0.167 (0.050-0.562)	0.004
	12-16 years	0.348	1.417 (0.747-2.686)	0.286	-	0.602 (0.281-1.289)	0.191
≥16 years (ref)					0.507		

275 (53.1%) of the participants was low, in 187 (36%) it was moderate, and in 57 (10.9%) it was vigorous. The relationship between physical activity and age was determined using one-way ANOVA and the results showed no statistically significant relationship between different groups and low, moderate, and vigorous physical activity in terms of age ($P=0.14$). The results of Univariate analysis showed that there were no statistically significant correlation between living condition marital status and grade of education with physical activity whereas there was a significant association between gender, mother and father's occupation, as well as mother and father's educational level and the level of physical activity ($P<0.001$) (Table 3).

The results of multinomial regression analysis showed that students whose mothers worked freelance or were housewives were 0.37 and 0.19 times less likely to have moderate physical activity compared with those whose mothers were retired. There was no statistically significant relationship between mother's

occupation and the ratio of moderate to low physical activity. Students whose fathers worked freelance were 0.54 times less likely to have moderate physical activity compared with those students whose fathers were retired. Also, students whose fathers had lower than diploma education level were 3.15 times more likely to have moderate physical activity (Table 3).

Comparing vigorous to low physical activity, gender, mother's occupation and mother's education revealed no significant association with the level of physical activity ($P>0.05$). Students whose fathers worked freelance were 2.54 times more likely to have vigorous physical activity compared with students whose fathers were retired. Also, students whose fathers had governmental jobs were 3.15 times more likely to have vigorous physical activity as compared with students whose fathers were retired. In addition, students whose fathers had lower than diploma education level were 0.17 times less likely to have vigorous physical activity (Table 3).

Discussion

The results of the present study showed that approximately 50% of medical students had insufficient physical activity. The results of other studies, also, in different countries showed that 15.4% to 26% of medical students had low levels of physical activity (13-15). The results of other studies on medical students in Iran showed that 47% and 65% of students in Kermanshah and Hamadan Medical Universities had low levels of physical activity, respectively (16, 17). Comparison of different studies and the results of the present study showed that the medical students in developing countries had higher levels of physical activity as compared with medical students in Iran. Medical students in different cities of Iran do not have adequate physical activity. It seems that the social norm, culture, and health policies in different countries affect the level of physical activity in medical students. Medical students should understand the importance of physical activity to be able to recommend performing appropriate physical activities to the patients and individuals in the society in order to improve public health in the future. In addition, maintaining and promoting medical students' health as future physicians as well as productive workforce in society is essential. Therefore, fundamental activities should be designed and implemented to promote proper physical activity among medical students. The highest frequency of low physical activity in different areas was related to transportation and leisure time activity. The statuses of physical activity at home and at work were better than those of other areas in the current study. According to the results of the studies carried out on medical students in India (14) and in Egypt, the lowest median score of physical activity was related to the areas of domestic and gardening (18). Another study carried out on 19298 students from 23 countries showed that leisure time physical activity in students is lower than the recommended

values, and this is related to cultural and socio-economic situations of their countries (19). The use of motorized transportation as an alternative to walking and biking among medical students and failure to allocate leisure time to sports activities can be a representative of improper culture, lack of necessary infrastructures for walking and biking, doing low cost exercises in addition to lack of enough time in this group. In this regard, creating sports venues in the vicinity of schools, teaching hospitals, dormitories and offering student facilities as well as effective training with the emphasis on the role of physical activity in health can be helpful.

In the current study, more physical activity was reported by male students than by female students. In some similar studies, physical activity among the females was less than that in males (18, 20). In contrast, the results of a study in India showed that female medical students had more physical activity compared with male medical students (14). Physical activity in girls is significantly influenced by society's culture, beliefs, and customs. Medical students are not exempt from this rule. Therefore, community education and establishing appropriate measures to eliminate discrimination and gender inequality and encouraging young, educated girls to have regular physical activity can help improve public health.

In the present study, the level of physical activity in medical students was significantly associated with their parents' level of education and occupation. Parents are influential on the attitude and behavior of their children, especially in young age, in relation to physical activity and sports. Previous studies have shown that parents' high levels of education can affect the tendency of young adults toward physical activity. Children of fathers who do physical activity will have higher tendencies toward doing physical activity in the future; hence, father's role in pushing children towards physical activity is very meaningful (21).

Occupation and level of education are two key factors of the socio-economic status (22). Some previous studies demonstrated that the socio-economic status of a family is a significant risk factor for unhealthy lifestyle and sedentary lifestyle in students (23, 24). Therefore, considering the level of socio-economic status of each medical students and providing educational courses about the importance of physical activity and free exercise facilities could modify the inequality of physical activity due to the socio-economic status.

The valid and reliable international questionnaire was used in the present study, but due to the method of data collection which was based on using a self-administered questionnaire, some questionnaires were not completed accurately. It is recommended that further studies be conducted using interviews. Also, it is suggested that a deep case study be carried out in order to specifically examine the role of parents in physical activity among medical students.

The majority of medical students in Kerman University of Medical Sciences do not have sufficient physical activity. Considering different demographic variables, the socio-economic status of parents is an important factor. Policy-makers should design effective educational courses and also provide adequate facilities for students to have more physical activity. Governments should focus on the improvement of the socio-economic status of families and educating the parents to have more physically active youths in the future.

Conflict of interest

Authors declare no conflict of interests.

Acknowledgment

The authors would like to thank all medical students at Kerman University of Medical Sciences for their kind cooperation. The present article is based on the thesis by Monavareh Sheikhsioaei and was financially supported by Kerman

University of Medical Sciences (Grant No. 94/328; Ethical committee code: IR.KMU.REC.1394.290).

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