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ORIGINAL ARTICLE

Physical activity level of medical students: Is there a family effect?

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Abstract

Background: Sedentary lifestyle is common in various age groups all over the world and it is an important public health issue because of its adverse effects on health. Taking actions against inactivity among medical students is important because they will become role models for their patients as future doctors. In this research, physical activity (PA) frequency and factors affecting participation in PA among medical students were studied.

Methods: Six hundred sixty-eight medical students from Gazi University Medical Faculty took part in the study. The students answered sociodemographic questions in addition to completing the Global Physical Activity Questionnaire (GPAQ).

Results: One-quarter (24.9%) of the participants did no physical activity. Logistic regression indicated that being female (OR: 1.7), father's inactivity (OR: 2.2), and family income less than 4500 TL (OR: 1.5) were significant factors in not doing PA among the medical students.

Conclusions: As medical students will play a critical role in improving public health as future doctors, intervention programs should be encouraged in order to increase the PA level of medical students to create a healthy lifestyle habit.

Keywords: Youth, Physical Activity Level, Medical Students, Turkey.

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INTRODUCTION

Physical inactivity is a significant global public health problem because of its adverse effects on health. Physical activity (PA) improves physiological, metabolic and psychological parameters, reduces risks of chronic diseases and early mortality rates, and preserves bone, muscle and joint health and functionality (1). Physical inactivity is the fourth leading risk factor of mortality globally (2).

The World Health Organization (WHO) states in its 2018-2030 Physical Activity Action Plan that globally, 25% of adults and 75% of adolescents do not meet the PA levels recommended by the WHO (3). In the same report, the WHO calculated the global direct healthcare cost of physical inactivity as 54 billon dollars in 2013, and an additional $14 billion as loss of productivity. In a previous study by Samuel et al., which covered 76 countries, the overall physical inactivity prevalence was 21.4%. (4) In the WHO's previous 2010 statistics, 23% of people over the age of 18; 19% of the youngest adults, and 55% of the oldest adults did not meet the WHO-suggested physical activity goals. Comparing the WHO's two reports from 2010 and 2018, global physical inactivity is on the rise.

The PA level, or rather the lack of PA, of young people is a determining factor in the occurrence of preventable health problems in adulthood. Thus, measuring PA levels in young people, and those in early adulthood, and developing appropriate interventions to encourage PA and an active lifestyle is important in these age groups (5). The studying age at university corresponds to late adolescence and the early adulthood phase of life, and for some students these periods are stressful times affected by extrinsic factors (6,7).

In a 2010 Turkey Nutrition and health Survey (TBSA), 44.6% of 15-18–year-old and 69.5% of 19-30–year-old males reported that they did not exercise, and an even higher 72.5% of 15-18–year-old and 76.6% of 19-30–year-old females reported they did not exercise either (8).

In the current study, a quarter of the medical students did not have enough PA. Although the remainder performed an adequate amount of PA, a feeling of competence is important when it comes to prescribing exercise to patients in counselling practices. In a 2017 study on fifth-year Australian medical students, after a 4.5-week geriatric medicine and exercise course, students had the greatest score improvements in referring older people to exercise programs and designing exercise prescriptions (9). In a 2004 study on 1906 freshman medical students from 17 medical schools in the United States of America, the authors found that the medical students who did strenuous exercise believed that their exercise habits were highly relevant (79%) for counselling patients about physical activity in the future (10).

Although, studies about PA are abundant in our country and globally, those covering medical students about PA and use of the Global Physical Activity Questionnaire (GPAQ) on them are limited and nearly nonexistent nationally. Medical students have strategic importance for improving health through PA because of being a part of the healthcare services and their age group, both for themselves and their patients. Thus, more studies are needed to evaluate the PA level of medical students and factors that affect their ability to do the recommended amount of PA. In addition, previous studies generally used questionnaires evaluating PA in the previous week, rather than general PA behaviors. The GPAQ used in this research was used for the first time in our country on medical students since its validity was checked (11). The GPAQ was developed by the WHO for PA surveillance.

MATERIALS AND METHODS

Research Design and Participants

Permission for the study was granted by the ethics committee of Gazi University (Date: 12.02.2018 / No:85). The participants were students of a medical faculty in Ankara province. Clustered sampling was used for choosing the participants, considering each year of study as a cluster. Using Epi-Info, the 2017 Turkey physical inactivity prevalence was 43% (12), alfa (Type I error) 5%, power 80% and at 95% confidence level, thus 668 participants were chosen. The required number of samples was calculated by the weight of the cluster, i.e. using the number of students in each year of study and the total number of medical students. All candidates accepted to take part in the research and completed the questionnaire. The number of participants in each year is given in Table 1.

Table 1. Research sample group and grade distribution

Year	Total Number of Students	Sample Group	Completed Responses
1st	474	114	114
2nd	522	126	126
3rd	443	106	106
4th	515	124	124
5th	439	106	106
6th	385	92	92
Total	2778	668	668

This study was approved by the clinical research ethics committee of the Gazi University (Date: 12.02.2018 number: 85).

Data Source and Calculation of Physical Activity Level

The data source in the study was the answers of sociodemographic questions and the GPAQ. The survey was conducted through face-to-face interviews. The GPAQ collects information on PA participation in three domains, and also sedentary behaviors: activity at work, travel to and from places, recreational activities. A population's physical activity (or inactivity) with GPAQ can be described in different ways. The two most common ways are; to estimate a population's mean or median physical activity using a continuous indicator such as MET-minutes per week or time spent in physical activity, or to classify a certain percentage of a population as 'inactive' or 'insufficiently active' by setting up a cut-point for a specific amount of physical activity. The WHO considers a PA level of 600 MET / min / week as the threshold; anything below this is considered inadequate PA, above is adequate. The validity of the Turkish version of GPAQ was assessed by Adiguzel et al. in 2017 on a group of medical faculty students of Ege University; the validity score was found as strong-very strong (Kappa 0.74-0.87, $p<0.0005$) (11)

Statistical Analysis

The research data were evaluated using the SPSS 21 (Armonk, NY) statistics software. The distribution of variables was evaluated using observational (histograms and possibility graphics) and analytical methods (Kolmogorov-Smirnov test). Descriptive data are given as mean and standard deviation (SD), frequency, percentage…etc. The Independent T-test (Student T-test) was used when the data follow normal distribution and Mann Whitney-U test was used when the data did not follow normal distribution. Logistic regression was used for multivariate analysis. Prior to logistic regression, MET values of variables affecting PA level were evaluated using univariate analysis. In the backward model, variables were included if they were significant between 0.05 - 0.20 level. This study was approved by the clinical research ethics committee of the Gazi University (Date: 12.02.2018 number: 85).

RESULTS

There were 668 participants, comprising of an equal number of males and females. The mean age of the students was 21.3±2.1 years. Fifty-four (8.1%) students reported having chronic diseases, 13.2% were regular smokers, and 2.4% consumed alcohol regularly. Of the participants, 44.3% were from families whose family income was over 4500 TL. Sixteen percent of each grade was represented in the research population. Almost three-quarters (73.1%) of the participants described themselves as being overweight or obese.

The metabolic scores of the participants and their distribution is given in Table 2. Five hundred two (75.1%) participants, had adequate MET scores of 2501.97+121.97, and 166 (24.9%) participants had inadequate MET scores of 209.39+201.66.

Table 2. Participants' Metabolic Equivalent Scores

MET Score	Number / (Percentage)	Mean Score ± SD	Median (min-max)
Adequate	502 (75.1%)	2501.97 ± 121.97	1680 (600-28560)
Inadequate	166 (24.9%)	209.39 ± 201.66	200 (0-580)
Total	668 (100.0%)	1932.26 ± 256.69	1130 (0-28560)

The MET scores of the medical students according to characteristics of their mothers and fathers are presented in Table 3. The median MET scores of students whose mothers had chronic diseases, were high school graduates or full-time employed, and performed regular PA were 1020, 1200, and 1680, respectively. The median MET scores of students whose fathers had chronic diseases, were night school graduates, in full-time employment, and performed regular PA were 1540, 1200, 1120, and 1540, respectively. Having fathers who were high school graduates and either fathers or mothers engaging in PA significantly affected the median MET scores of the medical students ($p<0.05$).

Table 3. Mean MET scores of medical students according to characteristics of their mothers and fathers

MET scores	Mother		Father	
	Mean (± SD)	Median (min-max)	Mean (± SD)	Median (min-max)
Chronic disease	1020.00 (± 1774.04)	1589 (0-12160)	1540.00 (± 2710.97)	1200 (0-12160)
High school graduation	1200.00 (± 2005.52)	1200 (0-14280)	1200.00 (±1952.93)	1865 (0-14280) *
Full time employment	1200.00 (± 2075.97)	1858(0-14280)	1120.00 (± 2368.55)	1936 (0-19920)
Doing physical activity	1680.00 (±2892.47)	2424 (0-19920) *	1540.00 (± 2710.97)	2366 (0-19920) *

* Mann Whitney-U Test is statistically significant, $p<0.05$

The factors affecting activity among the medical students are shown in Table 4. As family income dropped, so did the PA of students (OR: 1.5), similarly the fathers' being physically active increased PA among medical students (OR: 2.2). Male medical students performed more PA than their female peers (OR: 1.7).

Table 4. Distribution of factors affecting the physical activity of medical students

Factors		OR*	95% CI	P
Sex	Male	**1.7**	1.2-2.5	**0.004**
	Female	1		
Grade	Clinic level	1.1	0.8-1.6	0.57
	Pre-clinic level	1		
Self-perception	Under weight-normal	1.1	0.7 -1.6	0.59
	Overweight-obese	1		
Level of income (Median value)	4501 TL and over	**1.5**	1.1-2.3	**0.017**
	4500 TL and under	1		
PA status of mother	Performed PA	1.3	0.8 -2.2	0.24
	No PA	1		
PA status of father	Performed PA	**2.2**	1.3 -3.7	**0.002**
	No PA	1		

*OR odds relative risk factor

DISCUSSION

There is no doubt that PA is important in promoting health for people of all ages. There have been many studies looking at the various aspects of PA among the youth and medical students and the effect of physical activity on them. In a study by Ucok et al. (2011), 18% of medical students did not meet the WHO PA goals, and Savci et al. (2006) found that 16% of medical students did not have enough PA (13,14). The same GPAQ used by Savci et al. was used by Wattanapisit et al. (2015) on Thai medical students, reporting that 25.9% of the students did not perform enough PA (15). The physical inactivity prevalence of our medical students is in line with the literature.

Two hundred sixteen third-year medical students in New Zealand completed a voluntary PA learning module, consisting of three tutorials and one lecture. After completing the module, although students perceived themselves as moderately competent in counselling on PA, taking the module increased their awareness and knowledge about PA and their self-perceived confidence in providing PA advice increased (16). In both Australian and New Zealand studies, medical students were physically active and exercising.

The effect of sex on PA in the general population has been well studied. Research on the PA levels of medical faculty students (15,17,18) and university students (14,19) showed that more females than males did not meet the WHO-defined PA goals. Likewise, in the current study, females were more physically inactive than their male peers. This may be a cultural issue because of the gender bias in public. Males doing regular physical activity may seem natural but women doing the same is frowned upon.

Looking at the literature on the connection between income and PA, a Brazilian study conducted on adolescents found that adolescents, especially males from low income backgrounds, performed less PA (20). In another study on the Finnish adult population, PA levels increased as income increased (21). Although culturally and economically different, these two examples present that better income allows people to do more PA. This suggests that income is one of the determinants of PA levels.

The children of physically active parents tend to be physically active. In a study on Brazilian adolescents, females were less physically inactive if their parents were doing PA (20). In a Canadian study, parents doing PA made their children more physically active than children whose parents were not (21). Fathers doing PA has the highest determinant effect in doing PA both on sons and daughters in a family (22). In our study, the PA level of the mother and father was designed as a separate variable; and medical students' PA level decreases if their parents PA level is lower than the recommended level. According to the results of the logistic regression, the fathers being physically active was an important factor in the PA levels of medical students. This could be attributed to the father being taken as a role model during childhood and adolescence more than any other family member.

In the literature, it is emphasized that parents have a significant effect in taking up PA (22, 23). Thus, parents should be involved when devising intervention programs for increasing PA levels. Even though it may be late for current medical student's PA levels, today's medical students will set an example for their patients as future doctors and parents.

Studies in the relevant literature indicate that as the education level of parents decreases so do the PA level of their children (19, 24). In our study, although there was no significant relationship between the mothers' education level and the PA level of the medical students, the father's education level had a significant effect. The significant effect of taking the father as a role model and his education on the PA levels of the medical students could be attributed to the dominant effect of the father in patriarchal cultures.

Comparing our findings with the WHO data, the PA levels of the medical students were similar to the general population. Since today's medical students will play a significant role as future doctors in improving public health, their role in shaping the health of future generations is huge. Their understanding of the place of PA in health promotion and setting an example for their patients is important. When designing intervention programs for developing healthy living habits through PA among medical students, it should be kept in mind that they will set an example as PA practicing doctors (prescribing PA,setting PA plans for patients etc.).

Parents, especially fathers are important figures that determine their children's PA levels. When designing health promotion programs focusing on PA, parents should also be involved in these activities.

In several places on its website, in its reports and action plans, the WHO clearly emphasizes that PA is an effective intervention method for preventing noncommunicable diseases. Creating healthy living behaviors through increasing PA levels is not possible just with individual initiatives, lack of inactivity is a societal problem, thus it requires population-based, culturally appropriate, multi-sectoral and milti-disciplinary action plans. As leading members of the healthcare provision team, doctors should digest the importance of PA during their practice by actively participating in PA.

Declarations

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This study was approved by the clinical research ethics committee of the Gazi University (Date: 12.02.2018 number: 85).

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