

**Original article:**

**Examination of the effect of the gender factor on university students' physical activity level**

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**Abstract:**

**Objective:** Scientific research provide information concerning an insufficient level of physical activity of young people. This study was conducted to determine the levels of physical activity among university students. **Materials and Methods:** In 2014-2015 academic year, 510 students voluntarily participated in this study. To obtain data, the Personal Information Form and to determine the levels of physical activity. International Physical Activity Questionnaire (IPAQ) were used. **Results and Discussion:** It is found that the 32.8% of students were not physically active, 49.2% of them had low physical activity level, 18% of students had adequate physical activity level to protect their health. Although it was found that the male students' physical activity scores, moderately intense activity scores, intense activity scores and walking activity scores significantly higher than girls' activity scores ( $p<0.05$ ), there is no significant difference between sitting activity scores ( $p<0.05$ ). Between students who have Body Mass Index over and under 25 kg/m<sup>2</sup>, there was no significant difference found between total physical activity, moderately intense activity, intense activity, walking activity and sitting time scores ( $p<0.05$ ). **Conclusion:** It was determined that university students have low levels of physical activity and male students have higher physical activity levels than female students.

**Keywords:** Students; Turkey; physical activity level; International Physical Activity Questionnaire (IPAQ)

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**Introduction**

Physical activity can be defined as activities that occur with energy consumption by using our muscle and joints in daily life, increase the rate of heart and respiratory, and result in fatigue in different intensities.<sup>1</sup> Sporting events (regular, as competition activity), exercise (structured or planned physical activity), chores and gardening, and workplace physical activities are included to this definition.<sup>2</sup> Nowadays, sedentary lifestyle and gaining weight are common problems. Many technology products that entered people's daily life such as household

appliances, elevators and escalators, travel vehicles, and machines used in workplaces, factories, and agriculture has decreased the physical activity and energy consumption.<sup>3</sup>In particular, industrialization and technological advances brought about by urbanization increases the physical inactivity; leading to an increase of the time spent in sedentary activities like youth and children watching television, using computers, and playing games at cybercafé.<sup>4,5,6,7</sup> Despite the increase of leisure time, most of the people do not allocate enough time to physical activity in leisure time.<sup>3</sup>The decrease of physical activity and

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the alternation to an inactive lifestyle increases the risk of developing obesity, coronary heart disease, diabetes, osteoporosis, and some certain types of cancer.<sup>8,9</sup> Regular physical activity on the other hand improves the physiological, psychological and metabolic parameters and decreases the risk chronic disease and premature mortality. At the same time, it prevents bone, muscle and joint disease and ensures the continuation of healthy life.<sup>10</sup> In the studies performed, it is emphasized that intermediate physical activity may prevent the occurrence of cardiovascular diseases, obesity and increase life satisfaction by regulating the mood.<sup>11,12,13</sup> Positive effects of regular physical activity on health is also related to exercise time and intensity. According to American Association of Sports Medicine (ACSM), the American Dietetic Association and Turkish Physical Activity Guide, adults should do at least 30 minutes of medium-level intense activity on every day or most days of the week.<sup>14,15</sup> Sedentary life style, due to starting to be seen more often and adverse effects on health, emerges as an important public health problem needed to be fought. In recent years, empowering and encouraging physical activity studies and policies have been stepped up by World Health Organization (WHO) in parallel with efforts to improve the quality of life.<sup>16,17</sup> Therefore, people becoming aware, increasing their physical activity, being healthy and displaying healthy life behavior also improve people's quality of life. Health-related behaviors acquired early in life affect the risk for problems that are related to life style may be seen on future dates. Moreover, physical activity level of young adults affects the incidence of preventive diseases that can cause problems in older age. In this sense, students knowing and practicing the healthy life and physical activity dimensions will provide an advantage to people in terms of life quality.<sup>1</sup> For this reason, it is becoming more important to research the health behavior of young people. In light of this information, the aim of this study is to view the physical activity level of university students.

### **Materials and methods**

510 college students who are studying in Arts and Sciences, Engineering, Economics and Administrative Sciences, Law, and Theology Faculties and Health Faculty and Health Services Vocational School at Sakarya University and volunteered to participate in the research took part in the study which was planned as descriptive and analytic.

### **Exclusion Criterias for Participation**

Students who have problems related to

musculoskeletal, cardiopulmonary system, metabolic system, and other systems that can affect physical activity habit, and use medication in the last three months (including oral contraceptives therapy) and students whose body mass index (BMI) are over 35 kg/m<sup>2</sup> were not included in the study.

**International Physical Activity Questionnaire (IPAQ):** In obtaining data, International Physical Activity Questionnaire (IPAQ) was used to determine students' physical activity levels. In our country, the survey that was developed by Craig et al. (2003)<sup>18</sup> in order to determine physical activity levels of participants in the age range 15-65 has been adopted to Turkish culture by Öztürk.<sup>19</sup> The survey consists of seven questions and the duration of intense physical activity (football, basketball, aerobics, fast cycling, weight lifting, cargo transport and so on), the duration of intermediate physical activity (light cargo transportation, the normal speed of cycling, folk dances dancing, bowling, table tennis and so on), the duration of walking, and daily sitting time has been questioned. In the evaluation of all activities, it was determined as criteria to perform each activity at once at least 10 minutes. The calculation of the total score of short form includes the sum of the duration (minutes) and frequency (days) of walking, intermediate intense activity, and intense activity. Sedentary score (level of sedentary behavior) is calculated separately. Total physical activity time (MET-min/week - MET = 3.5 ml/kg/min. While at rest, each person consumes 3.5 ml oxygen per minute per kilogram.) is calculated by converting intense, intermediate activity and walking time to MET period (rest oxygen consumption index) corresponding to basal metabolic rate. In the survey, it is accepted that the spent in intense physical activity (IPA)=8.0 MET, intermediate intense physical activity (IIPA)=4.0 MET, and walking (W)=3.3 MET. Total physical activity time participants perform are classified as followings (14).

Physical Activity Levels:

1. Physically inactive: under 600 MET-min/week.
2. Low physical activity: between 600-3000 MET-min/week.
3. Adequate physical activity: over 3000 MET-min/week.

BMI is calculated by taking the ratio of body mass in kilograms by the square of height in meters. It is defined that BMI  $\leq 18.5$  kg/m<sup>2</sup> is poor, between 18.6-24.9 kg/m<sup>2</sup> is normal, between 25.0-29.9 kg/m<sup>2</sup> is overweight and  $\geq 30.0$  kg/m<sup>2</sup> is obese.

Statistical Analysis: The data were evaluated

with computerized statistics program. First, normal distribution fit test is performed to the data (Kolmogorov-Smirnov test: 2.078,  $p > 0.05$ ), and then since it has been determined that the data is distributed normally, in examining the relationship between variables, Pearson Correlation Analysis and in comparison of variables for Independent Samples, t-Test was used. The results are given as average  $\pm$  standard deviation.  $p < 0.05$  is accepted statistically significant.

**Ethical issue:** The study was carried out after the approval of the University rectorate (34671234/044/2015).

### **Results and discussion**

It was determined that 80% of students participating in the study are women and 20% of them are men, the average age is  $20.34 \pm 2.54$ , the average height in female students is  $162.96 \pm 9.0$  and in male students is  $173.96 \pm 6.4$ , the average body weight in female students is  $57.73 \pm 14.4$  and in male students is  $74.73 \pm 12.1$ , and the average BMI in female students is  $20.89 \pm 2.07$  and in male students is  $22.35 \pm 2.71$ . It was found that 93% of students do not do sports, 9% smoke, 4% use alcohol, and 7.3% use hookah.

It was found that students' total weekly energy consumption calculated according to IPAS is  $1823.84 \pm 1513$  in female students,  $2346.54 \pm 1243$  in male students and  $1959.34 \pm 1368$  MET-min/week in total. It was observed that walking activity comprises a significant part of total physical activity score in both female and male students. Although it was found that total physical activity score, intermediate intense activity score and intense activity score of male students are significantly more than female students' ( $p < 0.05$ ), it was detected that there is no statistically significant difference between female and male students' walking and sitting activity scores ( $p > 0.05$ ) (Table I). It was detected that 32.8% (female:20,2%; male:12,6%) of students generally are physically inactive, physical activity level of 49.2% (female:22,4%; male:26,8%) are low, and physical activity level of 18% (female:6%; male:12%) are enough to maintain health (Table II). It was found no statistically significant difference between students whose Body Mass Index is above  $25 \text{ kg/m}^2$  in terms of total physical activity, intermediate intense activity, intense activity, walking activity and sitting time scores ( $p > 0,05$ ). In case of those whose Body Mass Index is below  $25 \text{ kg/m}^2$ , just total physical activity scores of male students was more than female students' ( $p < 0,05$ ) (Table III).

It was detected that there was no statistically

significant difference between physical activity levels of participants according to the average of age and the use of cigarettes, alcohol and hookah ( $p < 0.05$ ) (Table VI).

In this study to assess the level of physical activity in university students by using IPAS, is determined that activity level of 82% of students are inadequate to maintain and improve health and only 18% of students do adequate physical activity. This result shows that lack of physical activity in university students that reflect young adult population is critical. Burke and colleagues (2005)<sup>20</sup> in a study of 594 college students they do in Canada, showed that only 10% of students have an adequate physical activity level. Hallal and colleagues (2003)<sup>21</sup> in a study using IPAS, it was determined that 41% of 3182 people between 20-70 years old have physical inactivity; this rate was found 38% in those in the 20-29 age group. Considering the results of our study, the fact that students hardly do intense and intermediate intense activities draws attention. It is thought that allocating less and less time to exercise by the influence of today's modern lifestyle, watching television, spending more time at the computer and video games and so on may be among the reasons for students' extremely low physical activity levels.

In our study, male students' physical activity level in every categories except for walking and sitting (total, intense, and intermediate physical activity) was determined to be significantly more than females'. This finding supports earlier research results<sup>1,22,23</sup> Ölçücü and colleagues (2015), in their study on 455 university students, as similar to our findings, stated that physical activity level of 64% of students is inadequate and female students' physical activity level is lower than males'<sup>23</sup> In our study, the reason that female students' physical activity level is lower than males' is interpreted as women not allocating time to physical activity since social role of women than men are more in our society. In addition, the fact that some of the physical and anthropometric characteristics are different from men like women's body fat percentage may be the cause of the physical differences between the sexes. In a study conducted, it was determined that youth who have a high-fat percentage have lower level of physical activity and the time spent on intense exercise is less<sup>24,25</sup>

According to the results of our study, among students whose BMI is above  $25 \text{ kg/m}^2$ , there were no differences in terms of total physical activity, intermediate intense activity, intense activity, walking activity, and sitting time. However, among

students whose BMI is below 25 kg/m<sup>2</sup>, only total physical activity scores was found to be higher in male students than female students. In the literature, there are studies showing that there is a negative relationship between physical activity and BMI in young adults.<sup>26,27</sup> However, Raustorp and colleagues (2004)<sup>28</sup> in a study conducted among students 7-14 age group, reported that there is no relationship between physical activity levels obtained with pedometer and BMI. Hallal and colleagues (2003) also stated that there is no relationship between physical inactivity and BMI. Again, Savcı and colleagues (2015) in a study conducted with college students studying at medical department reported that there is no difference between overweight patients and non-overweight patients according to BMI in terms of physical activity level in parallel to our conclusion. Physical activity is important in preventing weight gain, but it has been shown to be ineffective in reducing body weight alone. Because physical activity behavior that need to be deal with nutrition, genetic factors, habits and behavioral factors, is regarded as only one of the factors that make weight control program. In addition to this, physical activity without a decrease in weight that can be measured provides metabolic adaptation which has health protective effects.<sup>28</sup> In the study, although physical activity level of non-smokers are higher than smokers in every categories, statistically significant differences were not found (Table 4). Similar to the results obtained from our study, in a study conducted by Soyuer and colleagues (2011)<sup>29</sup> it was determined that non-smoker students have higher physical activity. Due to the, young age of our study group and the small amount of cigarettes using (9%), it is thought that the negative effect of smoking on physical activity do not emerge yet and further studies are needed in this regard. Furthermore, in our study, it is determined that alcohol and hookah usage of the participants does not affect the level of physical activity.

### **Conclusions**

It is determined that physical activity level of university students is low and physical activity level of female students is lower than male students'. Support, education, and opportunity needed should be given to increase the level of physical activity in order to maintain and improve the health for university students. It might be advised to focus on effective teaching approaches to increase physical activity behaviors and motivations of university students in this regard. Additionally, efforts to improve the educational system, including the implementation of

physical education programmes for females should be made, and a larger number of society facilities for exercise should be established specifically for women and adolescent girls.

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### **Disclaimer**

This study was presented at the congress as abstract.

### **Conflict of Interest**

The authors declare that they have no competing interests.

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**Authors's Contribution:**

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**TABLE I: Comparison of the physical activity scores obtained from International Physical Activity Survey (IPAS) by gender.**

Physical Activity	IPAS Score		Statistical Analysis	
	Female X±SS	Male X±SS	t*	p
<b>Total Physical Activity (MET-min/week)</b>	1823±1513	2346±1243	2.643	<0.05
<b>Intense Physical Activity (MET- min/week)</b>	257±760	493±701	2.879	<0.05
<b>Intermediate Intense Physical Activity (MET-min/week)</b>	190±412	348±536	3.668	<0.05
<b>Walking Physical Activity (MET-min/week)</b>	1347±1147	1456±1012	1.256	>0.05
<b>Sitting (min)</b>	512±157	578±163	0.878	>0.05

\*Independent t test.

**TABLE II: Physical activity levels in female and male students**

Physical Activity Levels	Female (n:408)	Male (n:102)	Total (n:510)
Physically inactive	20.2	12.6	32.8
Low physical activity level	22.4	26.8	49.2
Adequate physical activity level	6.0	12.0	18.0

**TABLE III: Comparison the physical activity scores of students whose Body Mass Index (BMI) is above or below 25 kg/ m<sup>2</sup> by gender**

Physical Activity	IPAS Score					
	BMI <25 kg/m <sup>2</sup>			BMI >25 kg/m <sup>2</sup>		
	Female X±SS	Male X±SS	p*	Female X±SS	Male X±SS	p*
Total Physical Activity (MET-min/week)	1790±1313	2446±1041	<0.05	1765±1219	1846±1411	>0.05
Intense Physical Activity (MET- min/week)	257±741	393±571	>0.05	223±775	397±524	>0.05
Intermediate Intense Physical Activity (MET-min/week)	148±392	148±536	>0.05	138±352	188±521	>0.05
Walking Physical Activity (MET-min/week)	1247±1157	1352±1012	>0.05	1245±1053	1214±1214	>0.05
Sitting (min)	502±103	568±163	>0.05	442±103	468±163	>0.05

\* *Independent t test.***TABLE IV: Comparison of physical activity scores in smoker and non-smoker students**

Physical Activity	IPAS Score		Statistical Analysis	
	Smokers X±SS	Non-Smokers X±SS	t*	p
Total Physical Activity (MET-min/week)	1823±1513	1980±1243	1.046	>0.05
Intense Physical Activity (MET- min/week)	357±760	371±701	0.739	>0.05
Intermediate Intense Physical Activity (MET-min/week)	203±412	210±536	1.602	>0.05
Walking Physical Activity (MET-min/week)	1347±1243	1556±1212	0.287	>0.05
Sitting (min)	412±158	478±160	0.878	>0.05

\**Independent t test.*

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