

**Examination of Physical Activity Levels of Young Adults\***

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ORIGINAL RESEARCH

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**Abstract**

The aim of the present study was to examine the physical activity levels of young adults in terms of some variables. A total of 206 people were included in the present study. The physical activity level and body mass index of the participants were determined. The physical activity level of the participants was evaluated with the short form of the International Physical Activity Questionnaire. In order to determine the body mass index, height and body weight of the participants were measured. The mean physical activity score of the participants was  $2554.41 \pm 1935.35$  MET-min/week. The mean body mass index of the participants was determined as  $21.96 \pm 3.21$  kg/m<sup>2</sup>. It was found that there was a statistically significant difference between males and females in terms of physical activity score ( $p=0.023$ ). A statistically significant difference was found between males and females in terms of body mass index ( $p<0.001$ ). It was determined that there was no statistically significant difference between smokers and non-smokers in terms of physical activity score ( $p=0.131$ ). It was determined that there was no statistically significant difference between smokers and non-smokers in terms of body mass index ( $p=0.988$ ). It was found that the relationship between physical activity categories and body mass index categories was not statistically significant ( $p=0.237$ ). The participation to physical activities should increase in young adults, especially women. Parameters that may be related to physical activity levels should be examined.

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**Genç Yetişkinlerin Fiziksel Aktivite Düzeylerinin  
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**Öz**

Bu çalışmanın amacı genç yetişkinlerin fiziksel aktivite düzeylerini bazı değişkenler açısından incelemektir. Bu çalışmaya toplam 206 kişi dâhil edilmiştir. Katılımcıların fiziksel aktivite düzeyi ve vücut kütle indeksi belirlenmiştir. Katılımcıların fiziksel aktivite düzeyi Uluslararası Fiziksel Aktivite Anketi kısa formu ile değerlendirilmiştir. Vücut kütle indeksini belirlemek için katılımcıların boy uzunluğu ve vücut ağırlığı ölçülmüştür. Katılımcıların fiziksel aktivite skor ortalaması  $2554,41 \pm 1935,35$  MET-dk/hafta'dır. Katılımcıların vücut kütle indeksi ortalaması  $21,96 \pm 3,21$  kg/m<sup>2</sup> olarak belirlenmiştir. Fiziksel aktivite skoru bakımından erkekler ile kadınlar arasında istatistiksel olarak anlamlı fark olduğu bulunmuştur ( $p=0,023$ ). Vücut kütle indeksi bakımından erkekler ile kadınlar arasında istatistiksel olarak anlamlı fark bulunmuştur ( $p<0,001$ ). Fiziksel aktivite skoru bakımından sigara kullananlar ile sigara kullanmayanlar arasında istatistiksel olarak anlamlı fark olmadığı saptanmıştır ( $p=0,131$ ). Vücut kütle indeksi bakımından sigara kullananlar ile sigara kullanmayanlar arasında istatistiksel olarak anlamlı fark olmadığı tespit edilmiştir ( $p=0,988$ ). Fiziksel aktivite kategorileri ile vücut kütle indeksi kategorileri arasındaki ilişkinin istatistiksel olarak anlamlı olmadığı bulunmuştur ( $p=0,237$ ). Genç yetişkin bireylerde özellikle de kadınlarda fiziksel aktivitelere katılım artmalıdır. Fiziksel aktivite düzeyleri ile ilişkili olabilecek parametreler incelenmelidir.

**Anahtar kelimeler:** Vücut kütle indeksi, Cinsiyet, Fiziksel aktivite, Sigara kullanımı

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## Introduction

The physical activities are the ones that are performed with energy expenditure by using the muscles and joints. There are various physical activities in competitions, exercises, hobbies, and daily life activities. The physical activities have effects on body composition. The regular physical activities increase muscle mass, decrease fat mass, and increase lean body mass (Reiner et al., 2013; Swift et al., 2018; Warburton and Bredin, 2017). The characteristics of physical activity should be taken into account when evaluation the level of physical activity. These characteristics are duration, intensity, frequency, effectiveness, type, purpose of the physical activity (Aparicio Ugarriza et al., 2015; Hills et al., 2014). The evaluation of physical activity can be done by various methods. It is important to evaluate the level of physical activity with accurate and reliable methods. There are direct and indirect methods for the assessment of physical activity level. One of the methods is evaluation with physical activity questionnaires. The assessment with physical activity questionnaires is low cost, easy to apply, and practical (Ainsworth et al., 2015; Strath et al., 2013; Trost and O'Neil, 2014).

With the development of technology, generally a sedentary lifestyle has been shaped in societies. With the spread of a sedentary lifestyle, there is a decrease in physical activity level and an increase in body mass index (BMI). In addition, there may be an increase for obesity and some chronic diseases as a result of sedentary life. People's habits in adulthood are very important. The life habits that begin in young adulthood and are low in physical activity may continue in later years. Therefore, a sedentary lifestyle can occur in the lives of people (Değer and Vardar, 2021; Jakicic et al., 2019).

When the literature was examined, it was seen that studies were conducted on the physical activity level of individuals. Aktaş et al. (2015) found that 14.8% of adult individuals participating in their study had sufficient physical activity level, the rate of physical activity level being sufficient was 22.2% for men and 7.8% for women. They found a statistically significant relationship between physical activity level and gender. Papathanasiou et al. (2012) examined smoking behaviour and physical activity in Greek health science students. They reported that smoking was strongly and inversely associated with physical activity. Aksoydan and Çakır (2011) found a significant relationship between physical activity level and BMI groups in adolescents. It is important to evaluate the physical activity levels of young adults and to examine them in terms of variables that may be related. The aim of the present study was to examine the physical activity levels of young adults in terms of some variables.

## Materials and Methods

### *Research Group*

The research group consisted of 206 people who met the inclusion criteria. The inclusion criteria for the present study were being between the ages of 18-25, not having any communication problems, not having any disease, and living in Kahramanmaraş province of Turkey.

### *Collection of Data*

Individuals who volunteered to participate in the study were reached. Individuals who would participate in the study were directed to a private gym in Kahramanmaraş to fill out the forms and to have their measurements taken. Participants filled out the survey and an information form there. The information form included questions such as age, gender, and smoking status. Additionally, the participants' height and body weight were measured to determine their BMI.

In the present study, the short form of the International Physical Activity Questionnaire (IPAQ) was used to determine the physical activity levels of participants. The international validity and reliability study of the IPAQ were conducted by Craig et al. (2003). The Turkish validity and reliability of the IPAQ was carried out by Öztürk (2005). There are 7 questions in the survey. The questionnaire include questions about the frequency of walking, moderate and vigorous activities in the last week, and the time spent in these activities. In the last question, the time spent sitting is asked. The physical activity scores are calculated as MET-min/week. The score of physical activity is calculated by multiplying the number of days and minutes of activity by 8 for the vigorous physical activity score, by 4 for the moderate physical activity score, and by 3.3 for the walking score. The durations are multiplied by the MET value determined for each activity. The total physical activity score is determined by summing the calculated results for all activities. According to total physical activity score of the individuals, their physical activity levels are categorized as inactive, minimally active, and very active. Those with the physical activity score of less than 600 MET-min/week are in the inactive category, those with the physical activity score between 600-3000 MET-min/week are in the minimally active category, and those with the physical activity score of more than 3000 MET-min/week are in the very active category (Craig et al., 2003; Öztürk, 2005).

The height and body weight of participants were measured in the present study. Their height was measured with a Harpenden stadiometer (Holtain, U.K.). Their body weight was measured with an electronic scale (SECA, Germany). The BMI value of participants was calculated. Their BMI was calculated with division their body weight (kg) by the square of their height (m<sup>2</sup>). According to their BMI value, they were grouped as underweight, normal, overweight, and obese. According to these categories, those with the BMI of  $\leq 18.5$  kg/m<sup>2</sup> in the underweight category, those with the BMI between 18.6-24.9 kg/m<sup>2</sup> in the normal category, those with the BMI between 25.0-29.9 kg/m<sup>2</sup> in the

overweight category, and those with the BMI of  $\geq 30.0$  kg/m<sup>2</sup> in the obese category (Köksal, 2022; Tali et al., 2016).

### ***Analysis of Data***

SPSS program (version 25, SPSS Inc., Chicago, IL, USA) was used for statistical analysis of data. Descriptive statistical analyses were performed. In order to determine whether the test to be used is parametric or non-parametric, the distribution of data was tested. The Kolmogorov-Smirnov test was applied. It was found that the data conformed to normal distribution. An independent sample t-test was used to determine the statistical difference between the groups. The relationship between categorical variables was examined with the chi-square test. The statistical significance level was accepted as  $p < 0.05$ .

### ***Ethics of Research***

The ethics committee approval was obtained from the Medical Research Ethics Committee of Kahramanmaraş Sütçü İmam University (Date: 01.03.2022, Session no: 2022/08, Decision no: 09). Permission was also obtained from the Ministry of Youth and Sports. An informed consent form was obtained from the participants who agreed to participate in the study.

### **Results**

A total of 206 young adult individuals were included in the present study. The distribution of participants according to some characteristics is presented in Table 1.

Table 1

The Distribution of Participants According to Some Characteristics

Some Characteristics		Smoking Status		Total	
		Smokers	Non-Smokers		
Gender	Females	n	23	106	129
		%	17.83	82.17	100.00
	Males	n	29	48	77
		%	37.66	62.34	100.00
Total	n	52	154	206	
	%	25.24	74.76	100.00	

The mean and standard deviation values of participants for age, height, body weight, BMI, and physical activity scores are presented in Table 2.

Table 2

The Mean and Standard Deviation Values of Participants for Age, Height, Body Weight, BMI, and Physical Activity Scores

Variables	Mean±SD
Age (years)	19.38±1.61
Height (m)	1.68±0.93
Body Weight (kg)	62.54±12.87
BMI (kg/m <sup>2</sup> )	21.96±3.21
Physical Activity Score (MET-min/week)	2554.41±1935.35

BMI: Body Mass Index, SD: Standard Deviation

The comparisons of physical activity scores and BMIs according to characteristics of participants are presented in Table 3. A statistically significant difference was found between males and females in terms of physical activity score ( $p=0.023$ ). The mean of males' physical activity score was higher than the mean of females' physical activity score. It was found that there was no statistically significant difference between smokers and non-smokers in terms of physical activity score ( $p=0.131$ ). A statistically significant difference was found between males and females in terms of BMI ( $p<0.001$ ). The mean of males' BMI values was higher than the mean of females' BMI values. It was found that there was no statistically significant difference between smokers and non-smokers in terms of BMI ( $p=0.988$ ).

Table 3

The Comparisons of Physical Activity Scores and BMIs According to Characteristics of Participants

	Physical Activity Score Mean±SD	t	p	BMI Mean±SD	t	p
<b>Females</b>	2318.45±1954.74	-2.288	<b>0.023*</b>	21.33±2.89	-3.781	<b>&lt;0.001*</b>
<b>Males</b>	2949.70±1847.99			23.02±3.44		
<b>Smokers</b>	2905.36±2097.62	1.517	0.131	21.96±3.16	0.015	0.988
<b>Non-smokers</b>	2435.90±1869.74			21.96±3.23		

BMI: Body Mass Index, SD: Standard Deviation, \* $p<0.05$

The results of relationship between physical activity categories and BMI categories are presented in Table 4. It was found that the relationship between physical activity categories and BMI categories was not statistically significant ( $p=0.237$ ).

Table 4

The Results of Relationship Between Physical Activity Categories and BMI Categories

Categories	Physical Activity Categories						$\chi^2$	p
	Inactive		Minimal Active		Very Active			
BMI Categories	n	%	n	%	n	%		
<b>Weak</b>	1	4.76	13	61.91	7	33.33	8.011	0.237
<b>Normal</b>	20	12.58	86	54.09	53	33.33		
<b>Overweight</b>	1	4.76	15	71.43	5	23.81		
<b>Obese</b>	1	20.00	2	40.00	2	40.00		

BMI: Body Mass Index

The results of relationship between gender and physical activity categories, between smoking status and physical activity categories are presented in Table 5. A statistically significant relationship was found between gender and physical activity categories ( $p=0.020$ ). However, no statistically significant relationship was found between smoking status and physical activity categories ( $p=0.052$ ).

Table 5

## The Results of Relationships Between Gender, Smoking Status and Physical Activity Categories

Physical Activity Categories	Females		Males		$\chi^2$	p
	n	%	n	%		
Inactive	17	13.18	6	7.79	7.857	0.020*
Minimal Active	79	61.24	37	48.05		
Very Active	33	25.58	34	44.16		
Physical Activity Categories	Smokers		Non-smokers		$\chi^2$	p
	n	%	n	%		
Inactive	1	1.92	22	14.29	6.004	0.052
Minimal Active	32	61.54	84	54.54		
Very Active	19	36.54	48	31.17		

\*p&lt;0.05

**Discussion and Conclusion**

The present study findings indicated that the majority of young adult individuals were in the minimally active category as the physical activity category. It was concluded that physical activity levels in young adults differed according to gender and did not differ according to smoking status. It was concluded that BMI values in young adults differed according to gender and did not differ according to smoking status. In addition, no significant relationship was found between physical activity categories and BMI categories.

In the present study, it was found that there was a statistically significant difference between males and females in terms of physical activity score. The mean physical activity score of males (2949.70±1847.99 MET-min/week) was higher than the mean physical activity score of females (2318.45±1954.73 MET-min/week). In addition, the relationship was found to be statistically significant between gender and physical activity categories. The results of the present study regarding gender variable was similar to the results of Vural et al (2010)'s study. Vural et al. (2010) found the difference in physical activity levels according to gender to be statistically significant. The results of the present study regarding gender variable differed from the results of Aydın and Solmaz (2016)'s study. Aydın and Solmaz (2016) did not find a statistically significant difference in terms of gender in the physical activity levels of students. Only students participated in their study. In the present study, not only students were included, young adults were included. When the present study was compared with the study of Aydın and Solmaz (2016), it can be thought that the reason for the difference according to gender variable is due to the characteristics of participants. It can be interpreted that the physical activity levels between male and female students are more similar than between male and female individuals who not students.

In the present study, it was found that there was no statistically significant difference between smokers and non-smokers in terms of physical activity score. In addition, the relationship was not found to be statistically significant between smoking status and physical activity categories. The results of the present study related to smoking status can be interpreted as in agreement with the

results of Aydın and Solmaz (2016)'s study. They could not find a statistically significant difference in the physical activity levels of students in terms of smoking in their study. The results of the present study regarding smoking can be interpreted as differing from the results of Kızar et al.'s (2016) study. Kızar et al. (2016) determined that there was a significant difference between vigorous activity, weekly walking activity and total physical activity values according to the smoking status of university students. The participants were divided into groups as regular smokers, occasional smokers, smoked-quit, and non-smokers according to cigarette use in their study. However, the smoking status was categorized as smokers and non-smokers in the present study. It can be thought that determining smoking status categories in more detail may lead to differences in the results.

In the present study, it was found that there was a statistically significant difference between males and females in terms of BMI. The average BMI of females ( $21.32 \pm 2.89 \text{ kg/m}^2$ ) was lower than the average BMI of males ( $23.01 \pm 3.43 \text{ kg/m}^2$ ). While the physical activity score was lower in females than in males, the BMI value was also lower in females. These findings may have resulted from the diet programs and other habits for weight control of women. The results of the present study on BMI between females and males showed similarity with the results of Yıldız et al. (2015)'s study. However, the results of the present study regarding BMI and gender was determined by Soyuer et al. (2010) showed no similarity with the results of the study. Yıldız et al. (2015) found the BMI of males ( $24.92 \pm 3.15 \text{ kg/m}^2$ ) higher than that of females ( $21.23 \pm 3.18 \text{ kg/m}^2$ ) in their study. The individuals aged 21-25 years participated in Yıldız et al. (2015)'s study. The individuals aged 18-25 years participated in the present study. The similarity of the results may be due to the age ranges of the individuals participating in the studies. These results on BMI may be due to the similarity of young adults' nutrition and physical activities. On the other hand, Soyuer et al. (2010) could not find a statistical difference between the normal weight and obese groups in terms of gender. The university students participated in Soyuer et al (2010)'s study. The comparisons were made between normal weight university students (125 females, 36 males) and obese university students (10 females, 5 males) in their study. The age range for participants was 18-38 for those with normal weight and 19-38 for those with obese in their study. The number of categories in terms of BMI, the number of participants in categories, and the age range of participants may have been effective for the differences in results.

In the present study, it was found that there was not a statistically significant difference between smokers and non-smokers in terms of BMI. The results of the present study on BMI and smoking status showed similarity with the results of Öcalan et al. (2020)'s study. Öcalan et al. (2020) did not find a significant difference between smoking and BMI values in their study. The results of the present study regarding BMI and smoking status was not showed similarity with the results of Keskin et al. (2022)'s study. Keskin et al. (2022) found a statistically significant difference between

smoking and BMI. In their study, 189 smokers and 255 non-smokers were included. The number of participants may have been effective for differences in results.

In the present study, 116 participants were in the minimal active category as physical activity category. Namely, the physical activity scores of the majority for participants were in the range of 600-3000 MET-min/week. This result of the present study can be evaluated as being similar to the results of Öztürk (2005)'s study. Öztürk (2005) determined that 67.5% of university students were in the minimally active category in terms of physical activity levels. She stated that the majority of participants were in the minimally active category. The ages of individuals participating in Öztürk (2005)'s study were between 18-32. The ages of individuals participating in the present study were between 18-25. It can be considered that the age range was effective in the physical activity category. The habits of young adults in daily life and their participation in sportive activities may be similar. These factors may be reflected in physical activity levels. In the present study, 79 females (61.24% of female participants) and 37 males (48.05% of male participants) were in the minimally active category. The majority of females and males were in the same category. This result of the present study was similar to the result of Erdoğan and Revan (2019)'s study. In the study of Erdoğan and Revan (2019), 47.2% of females and 50.2% of males were in the minimally active category. In other words, the majority of male and female participants were in the minimally active category in their study.

In the present study, the relationship between physical activity categories and BMI categories was not statistically significant. It can be interpreted that this result of the present study is similar to the result of Memiş and Yıldırım's (2007) study, but different from the result of Vural et al. (2010)'s study. In the study of Memiş and Yıldırım (2007), the difference was not found between the obese lecturers and those with normal weight, according to the level of physical activity. On the other hand, Vural et al. (2010) found statistically significant the difference in physical activity levels according to BMI. In the study conducted by Vural et al. (2010), the participants were individuals who work at a desk. However, there were no such criteria for the present study. Vural et al. (2010) found that the physical activity levels of individuals with BMI of 25 kg/m<sup>2</sup> and above were found to be more adequate than those with BMI below 25 kg/m<sup>2</sup>. They examined BMI of participants by dividing into two categories as BMI<25 kg/m<sup>2</sup> and BMI≥25 kg/m<sup>2</sup>. Their study and the present study's results differences may be due to the number of BMI categories and the characteristics of participants.

In the present study, it was concluded that the majority of young adults were in the minimal active category. It was also concluded that physical activity levels in females were lower than in males. The physical activity levels should be examined in various populations. The determination of BMI enables the body weight of individuals to be evaluated according to the accepted ideal body weight. More comprehensive results can be achieved by evaluating the physical activity levels and

BMI together. Additionally, physical activity scores and levels should be examined in terms of some variables that may be related. The studies to be carried out in these contexts can contribute to increasing participation in physical activities.

### **Ethics Committee Permission Information**

Ethics evaluation committee: Medical Research Ethics Committee of Kahramanmaraş Sütçü İmam University

Date of ethics evaluation document: 01.03.2022

Number of the ethics evaluation document: Session no: 2022/08; Decision no: 09

### **Statement of Researchers' Contribution Rates**

The entire study was conducted by the sole author of the study.

### **Conflict Statement**

The author have no declarations of conflict regarding the study.

### **Acknowledgments**

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