

# Physical activity and mood responses: sport sciences students

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**Abstract.** *Study Objectives:* The aim of this study is to examine the correlation between physical activity and mood responses of sports sciences students. 371 female students (age:  $21.89 \pm 4.33$ ) and 277 male students (age:  $22.45 \pm 5.44$ ) - 648 in total - participated in the study. *Methods:* The personal information form developed by the researcher, International Physical Activity Scale (IPAQ) short form for activity levels, and the Brunel Mood Scale for mood responses were used in this study. *Results:* Findings of the study suggest that males are physically more active and feel more vigorous than females whereas females are physically more inactive than males and experience their negative mood responses more profoundly compared to males. When we analyse physical activity levels and mood responses, we figured out a negative correlation between physical activity levels and negative mood responses. We have also found out a positive relationship between vigorous mood and physical activity levels. *Conclusion:* Physical activity level of females is lower than that of males, which can be attributed to females experience negative feelings more profoundly. We can also state that males participate in highly intensive exercises more frequently than females do while the increase in their positive mood responses is also higher than that in females. We can suggest that students feel better as the physical activity level goes up and the decrease in physical activity levels of female students will have a negative effect on their lives due to its repercussions on their moods.

**Key words:** Physical Activity, Mood, Students, Sports Sciences

## Introduction

Technological developments of our era lead to diseases such as obesity and Type II Diabetes since people move less in their daily lives and the energy intake is not balanced with the energy need (1). Thus, physical activity is one of the most important actions for all individuals of any age to improve human health (2).

Physical activity is defined as the body movement that is produced through the contraction of skeletal muscles increasing energy consumption significantly (3). Physical activity includes all human movements from active sports performance, exercises, and many different types of activities to our hobbies and daily life activities in various dimensions (such as cleaning our homes, walking to our offices or riding a bicycle, etc.)

(1). Frequency as one of the three important components for exercise refers to the quantity an activity is repeated while time refers to the total period that is spent in activity and intensity is the amount of energy consumed during an activity; and intensity of physical activities is often divided into three categories as light (<3 MET), moderate (3-6.0 MET) and vigorous (> 6 MET) (4). The impact of physical activity on human health manifests itself very shortly as it starts, and it is also suggested that physical activities in shorter times and smaller quantities are helpful, too (2). Many international physical activity guidelines recommend accommodation of physical activity targets of mild-vigorous exercises for 150- or 75-minutes weekly (5).

It is stated that physical activity has benefits for human health (6). Regular exercise in various intensities

affects the physical and psychological wellbeing of people positively (7,8,9). Furthermore, inactivity is associated with negative consequences as physical and psychological disorders such as obesity, diabetes, cardiovascular diseases, stress, and depression (10,11,12). Lippi et al. (13) suggest that a decreased level of physical activity might have negative psychological effects and consequently, it leads people to experience the emotions such as anger, sorrow, provocation, and disappointment in a more profound fashion (14). Additionally, insufficient physical activity coupled with an unhealthy diet are among the main factors contributing to overweight, obesity, and type III diabetes (15).

Lack of physical activity leads to the development of overweight and obesity, and physiological conditions create a multi-variable structure fuelling over-consumption of food (16). Moreover, psychological factors are also critical in this multi-variable structure. Additionally, psychological factors play an important

role since they determine how individuals respond to this environment (17,18). Eating disorders such as emotional eating affect moods and may have an impact on psychological and mental health (19,20,21). The aim of this study is to examine the relationship between physical activity levels and mood responses of the student in the faculty of sports sciences.

## Methods

### Participants

371 females (age:  $21.89 \pm 4.33$ ) and 277 males (age:  $22.45 \pm 5.44$ ) studying in various departments of the faculty of sports sciences participated in the study voluntarily. Participants were briefed about the study before the questionnaires were given to them. Participants who volunteered to take part in the study filled

**Table 1.** Information of Research Group

	Women (n=371)	Men (n=277)	TOTAL (n=648)
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$
Age	21.89 $\pm$ 4.33	22.45 $\pm$ 5.44	22.13 $\pm$ 4.84
Height	165.04 $\pm$ 8.15	177.37 $\pm$ 9.35	170.31 $\pm$ 10.61
Weight	57.94 $\pm$ 10.01	73.74 $\pm$ 10.87	64.70 $\pm$ 13.0
BMI	21.22 $\pm$ 3.68	23.31 $\pm$ 2.83	22.11 $\pm$ 3.50
Underweight	13.7 (%)	3.6 (%)	9.4 (%)
Normal Weight	74.9 (%)	72.6 (%)	73.9 (%)
Overweight	6.7 (%)	21.3 (%)	13.0 (%)
Obese	1.9 (%)	2.2 (%)	2.0 (%)
International Physical Activity Questionnaire (MET/min/week)			
Light	1167.24 $\pm$ 4498.24	1064.88 $\pm$ 1577.52	1123.41 $\pm$ 3552.98
Moderate	340.46 $\pm$ 599.27	432.35 $\pm$ 634.17	379.74 $\pm$ 615.63
Vigorous	717.23 $\pm$ 1389.03	1477.10 $\pm$ 1975.04	1041.88 $\pm$ 1705.41
Total	2333.44 $\pm$ 5163.83	3078.74 $\pm$ 2930.49	2652.53 $\pm$ 4363.10
MOOD			
Fatigue	2.59 $\pm$ 1.01	2.02 $\pm$ 1.14	2.35 $\pm$ 1.10
Depression	2.62 $\pm$ 1.05	2.16 $\pm$ 1.17	2.42 $\pm$ 1.12
Anger	2.46 $\pm$ 1.07	1.80 $\pm$ 1.11	2.18 $\pm$ 1.14
Vigour	1.54 $\pm$ 0.93	1.81 $\pm$ 0.98	1.66 $\pm$ 0.96

MET=Metabolic Equivalent Task

in the questionnaires. It took them about 15-20 minutes to fill in the questionnaires on average.

## Data Collection Tool

### *International Physical Activity Scale – Short Form*

The International Physical Activity Scale developed by Craig and et al. (22) was used to determine the physical activity levels of students. The validity and reliability study of the International Physical Activity Scale was conducted by Ozturk (23). The criterion in the evaluation of all activities is that each activity should be conducted at least for 10 minutes at a time. Minute, day, and MET values are multiplied to find a score as “METmin/week”. Physical activity levels are categorized as physically inactive (<600 MET - min/week), low physical activity level (600 – 3000 METmin/week), and sufficient physical activity level (useful for health) (>3000 METmin/week) (22).

### *The Brunel Mood Scale*

The Brunel Mood Scale developed by Terry et al. (24,25) was used to determine the moods of participants. This scale, which originally consists of 24 items and 6 sub-dimensions, was adapted into Turkish by Cakiroglu (26). The number of items was reduced to 19 with the adaptation into Turkish and the Turkish version consists of 4 sub-dimensions such as anger,

depression, fatigue, and vigour. The Cronbach Alpha coefficients for the sub-dimensions are .75 for anger, .85 for depression, .81 for fatigue, and .78 for vigour. In this study, the Cronbach Alpha coefficient was determined as .88.

## Data Analysis

In this study, Skewness and Kurtosis values were examined for the normal distribution of data and it was found out that the data have normality. The arithmetic mean and standard deviation were used for the information of the research group. An independent Sample t test was used to determine whether physical activity and mood responses differed according to gender. The Pearson Correlation analysis was conducted to examine the relationship between physical activity and mood responses. The level of significance was used as  $p < 0.05$  for data analysis.

## Results

There are statistical results, in this part of the study, for the analysis of how the correlation between physical activity levels and mood responses differed in statistical terms.

Table 2 displays the t test results according to the gender variable. It was seen that, according to the gender variable, there was a statistically significant

**Table 2.** International Physical Activity Questionnaire and Mood Results according to Gender Variable

	Female	Male	t	p
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
<i>IPAQ Light (MET/min/week)</i>	1167.24 ± 4498.24	1064.88 ± 1577.52	-0.362	0.717
<i>IPAQ Moderate (MET/min/week)</i>	340.46 ± 599.27	432.35 ± 634.17	1.883	0.060
<i>IPAQ vigorous (MET/min/week)</i>	717.23 ± 1389.03	1477.10 ± 1975.04	5.739	<b>0.001*</b>
<i>IPAQ Total (MET/min/week)</i>	2333.44 ± 5163.83	3078.74 ± 2930.49	2.156	<b>0.031*</b>
<b>Fatigue</b>	2.59 ± 1.01	2.02 ± 1.14	-6.837	<b>0.001*</b>
<b>Depression</b>	2.62 ± 1.05	2.16 ± 1.17	-5.224	<b>0.001*</b>
<b>Angry</b>	2.46 ± 1.07	1.80 ± 1.11	-7.584	<b>0.001*</b>
<b>Vigour</b>	1.54 ± 0.93	1.81 ± 0.98	3.635	<b>0.001*</b>

\* $p < 0.05$

difference in all sub-dimension groups in IPAQ high, IPAQ total, and Brunel Mood Scale ( $p < 0.05$ ). In IPAQ high and IPAQ total, it was found that males had a higher physical activity level than females. In negative moods, it was seen that females were more tired, more depressive, and angrier than males, and males felt more vigorous than females.

It was concluded that there was not a significant difference between the groups in IPAQ light and IPAQ moderate ( $p > 0.05$ ).

In Table 3, it was seen that there was a negative very low correlation between IPAQ light and depression mood ( $r = -.081$ ,  $p < .05$ ) and a positive very low correlation between IPAQ light and vigorous mood ( $r = .147$ ,  $p < .01$ ). It was also seen that there was a negative very low correlation between IPAQ moderate and depressive ( $r = -.091$ ,  $p < .05$ ), and angry ( $r = -.100$ ,  $p < .05$ ) moods and a positive very low correlation between IPAQ moderate and vigorous ( $r = .257$ ,  $p < .01$ ) mood. It was found that there was a positive low correlation between IPAQ vigorous and fatigue ( $r = -.217$ ,  $p < .01$ ), depressive ( $r = -.174$ ,  $p < .01$ ), and angry ( $r = -.118$ ,  $p < .01$ ) moods while there was a positive moderate correlation between IPAQ vigorous and vigour mood ( $r = .348$ ,  $p < .01$ ). A negative very low correlation was seen between IPAQ total and fatigue ( $r = -.149$ ,  $p < .01$ ), depressive ( $r = -.150$ ,  $p < .01$ ), and angry ( $r = -.118$ ,  $p < .05$ ) moods whereas there was a positive moderate correlation with vigorous mood ( $r = .299$ ,  $p < .01$ ).

## Discussion and Conclusion

Results of our study suggest that male students have more vigorous activities than female students and the physical activity level of males is higher than that of females. Males have a more vigorous mood than females while females experience negative moods more profoundly than males do.

Obesity levels indicate pandemic dimensions worldwide as obesity constitutes a serious risk factor for chronic diseases such as hypertension, high cholesterol, type II diabetes, coronary cardiac disease, and cancer (16,27). Our results suggest that the vigorous physical activity level of male students and their total physical activity level are higher than those of females. As we screen the literature for the physical activity level of young people, it is reported that males are more active than females (28,29,30,31). It is considered that males are more active than females and their participation particularly in vigorous activities is more than that of females possibly because of their motivation to take part in the exercise. When we look at the studies (32,33,34) it is suggested that the role of gender is very critical in motivation to participate in the exercise. It is underscored that males have a greater tendency to be influenced by internal factors in getting motivated for exercise whereas external factors are much more motivating for females to get motivated to exercise (32). Gao and Xiang (33) stated that females

**Table 3.** Pearson Correlation Analysis

		1	2	3	4	5	6	7	8
1	IPAQ Light	1	.015	.095	.878**	-.054	-.081*	-.038	.147**
2	IPAQ Moderate		1	.473**	.347**	-.129**	-.091*	-.100*	.257**
3	IPAQ vigorous			1	.517**	-.217**	-.174**	-.180**	.348**
4	IPAQ Total				1	-.149**	-.150**	.118*	.299**
5	Fatigue					1	.835**	.785**	-.615**
6	Depression						1	.833**	-.615**
7	Angry							1	-.474**
8	Vigour								1

\* $p < .05$  \*\* $p < .01$

IPAQ= (MET/min/week)

participated in vigorous exercises as much as males did whereas they enjoyed it less than males. It is suggested in other studies that females faced more psychological pressure about their social appearance concerns (35) and, from the perspective of exercise motivation, such psychological pressure leads females to become less determined to participate in exercise (33).

Researchers suggested that psychological health problems had increased among university students in recent years (36,37). According to other results in our study, female students experience negative moods such as fatigue, depression, and anger more than males do. On the other hand, male students experience positive moods such as vigour more than females do. Du (38) found out that averages of positive moods such as being happy, energetic, and joyful in males were higher than that in females among university students participating in basketball competitions. Berger (39) suggested that there was a significant decrease in negative moods of male students such as stress, fatigue, and anger after yoga classes. Goleman (40) suggests that females would go through a more serious process of being affected by an incident than males would do since females experience emotional processes more profoundly than males.

Another important finding of our study is the correlation between physical activity levels and the moods of the students. Results indicate a negative correlation between light physical activity and depression whereas a positive significant correlation with vigorous mood. They further suggest a negative correlation between moderate physical activity and depression and anger while a positive correlation with vigorous mood. According to the results, there is a negative correlation between vigorous activity and negative moods such as fatigue, depression, and anger whereas there is a positive correlation with vigour mood. When physical activity is examined totally, similarly there is a negative correlation with negative moods while a positive correlation with positive moods. Studies suggest that physical activities have positive effects on human health (41); and the positive impacts of physical activity is not only limited to physical processes such as cardiovascular disease, obesity, hypertension, and diabetes (41) but they also include psychological and mental processes such as depression and anxiety (42). Moreover,

researchers (43–46) suggested that the effect of negative moods on psychological processes (depression, anxiety, stress, and tension) descended as physical activity levels went up. Studies have similarly suggested that positive effects come about in the moods of university students and negative effects disappear as their physical activity levels increase (47,48). Furthermore, the decrease in anxiety and other negative moods of university students associated with physical activity can also positively contribute to their healthy diet (49,48) and their academic performance (50).

Results of our study suggest that the physical activity level of male students and their participation in vigorous activities is higher than that of females. Female students experience their negative moods more profoundly than males do. As there is a negative correlation between physical activity level and negative mood responses, we can safely suggest that negative mood will go down and positive mood will go up with the increased physical activity level. Given all these results, we suggest that opening physical activity courses in universities and developing practices and events to promote such activities will help university students to feel better in both physical and psychological terms since the increased physical activity in university students will not only lead to a positive effect on their mood responses but also positively contribute in their overall health and academic performance as well.

**Conflict of Interest:** Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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