

THE CORRELATION BETWEEN PHYSICAL ACTIVITY AND ACADEMIC RESULTS OF STUDENTS FROM PARTIUM CHRISTIAN UNIVERSITY

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Abstract: Recent studies showed that regularly practiced physical activity is associated with good academic results, a positive impact on cognitive skills and an increase of the IQ. Academic results may be indicators of the intelligence levels of the students, but there are very few researches regarding the effects of physical activity on academic results. This study aims to analyze the relation between physical activity and academic performance. We performed a cross-sectional study on a sample group of 52 students from Partium Christian University. The students filled out standardized questionnaires about their physical activity levels and they indicated their general average grades they had obtained in the first semester of the 2018-2019 academic year. According to the results we encountered a statistically insignificant negative correlation between academic results and physical activity levels (Spearman rho = - 0.121, df = 50, p = 0.39; r = - 0.05, df = 52, p = 0.73,).

Key words: physical activity, academic results, body mass index, student

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INTRODUCTION

The advantages of practicing physical activities by different categories of the population are often presented in the specialty literature. Insufficient physical activity and low values of physical fitness in case of adult people are associated with high morbidity and mortality rates (Blair and Brodney, 1999). According to the National Institute of Statistics (2013), our country has almost the lowest life expectancy in the European Union occupying the 25th place on the list containing the total of 28 member states.

According to studies, sedentary lifestyle may lead to the appearance of certain health problems. Regularly practiced physical activity develops and maintains bone and muscle health, reduces the risk of developing obesity and chronic diseases, depression, anxiety, and induces a state of well-being. In order to maintain and improve cardiovascular fitness, to increase muscle fitness and to maintain bone health, World Health Organization recommends the practiced physical activity to be mostly moderate and intense.

Dishman, Heath & Lee (2013) define physical activity as being “any movement of the body associated with muscle contraction which increases energy consumption over the resting level” (p. 41).

According to World Health Organization (2013), out of the 80% of countries which declared having policies, plans or strategies to increase physical activity levels, only 56% were operational. Only 8% of the countries wished to promote regular physical activity by reducing

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taxes for sports equipment, programmes and memberships in fitness clubs, and increasing taxes for equipment which encourages developing a sedentary lifestyle. Finland and Canada reported the increase of physical fitness of their population in the last decade (Vuori et al., 2004; Muhajarine et al., 2012).

According to the World Health Organization's report (2015), physical activities bring health benefits and reduce the risk of developing cardiovascular diseases or others related to high blood pressure, diabetes or different types of cancer. At the same time, it reduces stress, anxiety and depression and may delay the onset of the Alzheimer's disease. Insufficient physical activity is responsible for 3.2 million deaths annually (Lim et al., 2012).

In the last few years researchers looked to highlight the advantages that regularly practiced physical activities have on cognitive skills and academic performance (Best, 2010; Sibley and Etnier, 2003).

It has been proven that regular practicing of physical activity triggers a change in the human brain, due to the increased metabolism, oxygenation and blood flow, resulting hormones which promote neurological health (Whiteman et al., 2014; Baidog and Herman, 2018; Papp et al., 2019). Recent studies showed that regularly practiced physical activity is associated with good academic results, a positive impact on cognitive skills (Haapala, 2013), social behavior or relationships (Lees and Hopkins, 2013; Tătar et al., 2018), and the increase of the IQ level (Corder, 1966; Ji-ying and Jie, 2000).

Academic results may indicate the intelligence levels of the students, but there are very few researches about the effects of physical activity on academic results.

For the year 2019, budgetary credits were provided through the education budget allocation, in the amount of 39,394.2 million lei. Identifying the relation between physical activity and academic results may create educational policies and practical study methods, increasing the importance of physical education classes within university education.

Measuring physical activity levels is a precondition for monitoring the health status of the population. The international questionnaire for measuring physical activity (IPAQ - International Physical Activity Questionnaire) represents a self-administered standardized instrument.

IPAQ uses a unit of measurement called metabolic equivalent or MET, that is the metabolic cost (oxygen consumption) of physical activity. A MET is the metabolic equivalent of the body when sitting quietly (approximately 3.5 ml/kg/min or 1 kcal/kg body weight/h) and it refers to the calorie consumption in different situations: walking 3.3 MET/min, moderate-intensity physical activity 4 MET/min, vigorous-intensity physical activity 8 MET/min. The IPAQ values are expressed in MET/min/week.

MATERIALS AND METHODS

The study was performed on a sample group of 52 students, 35 women and 17 men, from the Faculties of Letters, Arts, Economic and Social Sciences of Partium Christian University from Oradea. The students were selected from both urban and rural areas, and the measurements and the filling out of the questionnaires were performed between May the 13th – 14th, 2019. All students gave their consent to this study.

For this study we used the anthropometric method to measure the two somatic indicators: height and weight using a Seca 213 (Marsden, UK) height measure and an Omron BF511 digital scale (Omron Corporation, Kyoto, Japan). We know that the genetic inheritance and the rate of growth and development are different for each person. Thus, after calculating the BMI, the results are compared with the reference values, observing the growth path corresponding to each gender and age. In order to determine these values we used the EXCEL BMI calculator after Barlow (2007) (table 1).

This programme analyses and interprets the results according to the reference values depending on gender and age, providing this way a true image on overweight and obesity among the people of the sample group.

Table 1. Body mass index percentile categories (Barlow, 2007)

BMI Percentile	Nutritional Status
BMI<5 percentile/gender/age	Underweight
BMI between 5-84 percentile/ gender/age	Normal weight
BMI between 85-95 percentile/ gender/age	Overweight
IMC $\geq$ 95 percentile/ gender/age	Obesity

In order to measure the levels of physical activity, we used the IPAQ questionnaire. The seven questions of the questionnaire are oriented towards the physical activities practiced during the week preceding the filling out of the questionnaire. The questions are related to the frequency and intensity (light, moderate, vigorous) of the activities. The questions refer to sports as well as to other activities performed during free time.

The data of the individual measurements was statistically analysed on a computer using the Statistical Package for Social Sciences software: version 20.0 SPSS Inc. (SPSS). We performed the descriptive analysis (weighted mean ($\bar{X}_p$), standard deviation (τ)), the testing of the normality of the distribution with the Kolmogorov-Smirnov test, and we calculated the relation between the two variables using the Pearson and Spearman correlation coefficient (ρ).

RESULTS

After processing the collected data, we found that 35 women and 17 men participated to the measurements. The average height and weight values are higher for men than for women by 15.15 cm, respectively 21.42 kg (table 2).

Table 2. Mean values and standard deviations of height, weight, BMI, IPAQ and academic results

Gender	N	Height	Weight	BMI	IPAQ	Academic Results
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Women	35	164.03 $\pm$ 7.13	63.40 $\pm$ 9.19	23.56 $\pm$ 3.21	2367.10 $\pm$ 2916.47	8.09 $\pm$ 1.20
Men	17	179.18 $\pm$ 6.24	84.82 $\pm$ 15.42	26.34 $\pm$ 3.99	4293.20 $\pm$ 2589.98	7.68 $\pm$ 1.02

The registered data show that 38 subjects out of the total of 52 had normal weight for their age. A number of 10 subjects were overweight and 3 students were classified as obese (table 3).

Table 3. Distribution of BMI depending on the gender of the subjects

BMI Percentile / Nutritional Status	Women		Men	
	N	%	N	%
Underweight	1	3	0	0
Normal weight	28	80	10	59
Overweight	6	17	4	23
Obesity	0	0	3	18
Total	35	100	17	100

The Kolmogorov-Smirnov test showed a normal distribution of the academic results ($df = 52$, $p = 0.185$) and without a normal distribution in case of the levels of physical activity ($df = 52$, $p < 0.001$). In order to see the correlation between physical activity levels and academic results, we

used the Pearson (parametric) and Spearman (non-parametric) correlation coefficient. It resulted a statistically insignificant negative correlation between the academic results and the levels of physical activity (Spearman rho = - 0.121, df = 50, p = 0.39; r = - 0.05, df = 52, p = 0.73,).

CONCLUSIONS

The number of students with weight problems was higher among men (7 subjects) than among women (6 subjects) reaching a percentage of 25.30% of the sample group.

The correlation between academic results and the levels of physical activity is statistically insignificant (Spearman rho = - 0.121, df = 50, p = 0.39; r = - 0.05, df = 52, p = 0.73,). We met one women and no man in the underweight category.

We consider that there are necessary additional measurements for a larger and representative sample.

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