

## DIFFERENCES IN PHYSICAL ACTIVITY OF FEMALE STUDENTS IN THE FIRST YEAR OF THE FACULTY OF KINESIOLOGY AND THE FACULTY OF ECONOMICS

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### Abstract

Hypokinesia is one of the main threats to the preservation of human health and the fight against it helps to preserve our entire population. Accordingly, it should be pointed out that the most suitable for raising awareness in society of the necessity of physical activity are educated experts in the field of education and health. The aim of this paper is to determine the differences in physical activity between first – year female students of the Faculty of Kinesiology in Osijek and first – year female students of the Faculty of Economics in Osijek by using the International Physical Activity Questionnaire (IPAQ). The research was conducted on a sample of a 133 respondents, 15 first – year female students of the Faculty of Kinesiology and 118 first year female students of the Faculty of Economics of Josip Juraj Strossmayer University in Osijek. International physical activity questionnaires (IPAQ) were distributed to the participants when they arrived in the hall. The questionnaires contain a part with general data: name of the faculty, chronological age and gender of the respondents. A multivariate analysis of variance MANOVA of different groups was used to determine the differences between the applied physical activity assessment tests (IPAQ) between groups of subjects classified by college attended. Expectations were confirmed about the difference manifested in the variable Total average physical activity (PATA), where female students of the first year of the Faculty of Kinesiology have statistically significantly higher values compared to female students of the first year of the Faculty of Economics.

**Keywords:** students, IPAQ, Manova

### INTRODUCTION

World Health Organization (WHO) warns that 25% of adults and even 80% of adolescents are not enough physically active (WHO, 2018). (Guthold, Stevens, Riley, Bull, 2018) reported that the goal set for 2025 to reduce insufficient physical activity by 10%, according to the indicators, will not be achieved. In a 2015 study (Kalman et al, 2015), it was observed that the adolescence is the most important period for creating health habits, especially for engaging in physical activity that a person will engage throughout the life. A sedentary lifestyle has become dominant among students and a physical activity program should be designed to complement their free time, giving them the opportunity to develop a positive attitude towards physical activity. It can highly contribute to the popularization and acceptance of a healthy lifestyle. Based on the research (Lee et al., 2012), about 9% of premature deaths in the world, or slightly more than 5 million premature deaths per year, are to blame for a reduced, or insufficient level of physical activity. It is not surprising, therefore, that nowadays the promotion of physical activity occupies an important place in public health practice and that it represents one of the central measures in health promotion interventions at the global level and at the national and subnational levels (Pratt, Epping and Dietz,

2009). Decrease in physical activity itself makes a big harm to the health system, as evidenced by data from Canada, where Katzmarzyk and Jansen (2004) calculated that reduced physical activity causes 2.6% of total health costs. (Popkin, Kim, Rusev, Du and Zizza, 2006) note that, at first hand, direct costs such as consumption of drugs, costs of sickness or disability are less significant than indirect costs such as reduction of work ability, illness and mortality. The consequences of physical inactivity worldwide cost the health system billions of dollars annually (Ding et al., 2016). (Rosenberg et al., 2015) estimated that each hour of sitting in an older adult increases the cost of annual health care costs by \$126. Physical activity includes all activities of the locomotor system that require energy consumption. Although often perceived as a way of exercising, daily household chores, recreational activities, daily movement when leaving for work and working alone at work and traveling are considered physical activity (Caspersen, Powell and Christenson, 1985). The advantages of physical activity are most evident in the positive effect on an individual's health, self-confidence and overall emotional stability of a person. A previous study (Korn, Gonen, Shaked and Golan, 2013) proved that the student population that regularly engages in physical activity shows an improved external appearance, receives a lot more positive feedback from society, is in a significantly

better physical, health and emotional state and shows a higher degree self-confidence from students who are not physically active. Numerous scientific studies (Blair and Morris, 2009; Strong et al., 2005; Janssen and Leblanc, 2010; Miles, 2007) confirm countless positive effects of regular physical activity, and some of the most important are normalization of blood pressure, reduction of obesity, preventive effect on depression, reduction in the number of injuries, increase in bone density and reduction in blood cholesterol levels. Numerous studies have confirmed (Gusy, Lohmann, Marcus, 2012); Mir, Lichtenberger, Pichler, Wegscheider, 2012) that adolescence is a risky and stressful period of growing up that can leave consequences. This refers to people who will soon encounter many things that they have not experienced before. From changing the place of residence for part of the students, which therefore brings the care of independent finances, as well as eating habits, then getting to know the system at colleges, that highly differs from schools. On top of all that, what should not be neglected is the burden of social identity because there comes a period where young people have more independence from their parents than in high school (Keller, Maddock, Hannover, Thyrian, Basler, 2008); Garber et al., 2011). Although the situation is alarming in all age categories, it is the worst in older adolescents who continue their education at colleges, where there are often no organized physical and health education classes for even two hours a week, and the time they spend sedentary increases due to new obligations. Students sit while they are at lectures, while they read books in the library, while they are on the computer, while they listen to lectures in the classrooms. There are different teaching methods used in colleges, but the problem is always the same, students sit almost all the time. This way of working and living begins at the latest when starting primary school. This continues, in most cases, throughout life. Since in this research, first-year students, who are in the last stage of puberty, were taken as the population sample, it is important to say something about that stage of life. In this paper, we conducted research on the population of first-year students, so that would be late puberty. In the mentioned time interval, turbulent psychological, personal, physical and emotional changes take place. Surely one of the biggest is leaving the parental home, with an unclear position in one's environment, and therefore a very often stressful and emotionally intense period. As kinesiologist, we claim that late puberty or the period of starting studies, is a period in the life of the young population in which

the quality of their life can still be significantly influenced in terms of introducing physical activity as part of recreation to make the lifestyle as good as possible. At the same time, we believe that physical activity can contribute to a significant extent in finding answers to the previously mentioned situations and problems that young people face during puberty. The aim of this paper is to determine the differences in physical activity between first-year female students of the Faculty of Kinesiology in Osijek and first-year female students of the Faculty of Economics in Osijek in the level of physical activity using the International Physical Activity Assessment Questionnaire (IPAQ).

## **METHODOLOGY**

### **Sample of respondents**

The research was conducted on a sample of 133 respondents, 15 female students (12.3%) of the first year of the Faculty of Kinesiology and 118 female students (88.7%) of the first year of the Faculty of Economics of the Josip Juraj Strossmayer University in Osijek. Subsamples of respondents were formed according to the criteria of division according to the type of college they attend.

### **Sample variables**

The selection of relevant variables for this research was made based on many previous studies (Keller et al., 2008; Kalman et al., 2015; Guthold et al., 2018; Kaić, 2023), of course, in accordance with the problems that arise in the research. To assess the physical activity of female students, we used variables from the International Physical Activity Questionnaire (IPAQ) which is valid for the Croatian population (Pedišić, Jurakić, Rakovac, Hodak and Dizdar, 2011). Those are PAIT - physical activity in transport, PAHG - physical activities for household and gardening, PAFT - physical activity in free time, PAWA - physical activity in walking, PAMI - moderate intensity physical activity, PAEI - extreme intensity physical activity, PATA - total average physical activity,

### **Data processing methods**

A multivariate analysis of variance MANOVA of different groups was used to determine differences between the administered physical activity assessment tests (IPAQ) between groups of subjects classified by college attended. Statistical significance was set at  $p \leq 0.05$ .

**RESULTS**

When we look in detail at the results obtained in the physical activity questionnaire (IPAQ) of first-year students of the Faculty of Kinesiology and first-year students of the Faculty of Economics, we see that first-year students of the Faculty of Kinesiology have higher results in all variables in which there is a statistically significant difference, namely Physical Activity in transport (PAIT) at a

statistically significant level  $p = .007$ ; Physical activity in free time (PAFT) at a statistically significant level  $p = .000$ ; Physical activity of moderate intensity (PAMI) at a statistically significant level  $p = .004$ ; extreme intensity physical activity (PAEI) at a statistically significant level  $p = .000$ ; and Total average physical activity (PATA) at a statistically significant level of  $p = .000$ . In other variables where there are no statistically significant differences, Physical activity in walking (PAWA) and Physical activity in household and gardening (PAHG), first-year students of the Faculty of Kinesiology also have higher values compared to first-year students of the Faculty of Economics.

**Table 1.** Differences in physical activity between first-year female students of the Faculty of Kinesiology and first-year female students of the Faculty of Economics

Ranks			
	FACULTY GROUPS 1 Kinesiology 2 Economics	N	Mean Rank
PAIT	1.0	15	92.03
	2.0	118	63.82
	Total	133	
PAHG	1.0	15	68.20
	2.0	118	66.85
	Total	133	
PAFT	1.0	15	107.03
	2.0	118	61.91
	Total	133	
PAWA	1.0	15	90.13
	2.0	118	64.06
	Total	133	
PAMI	1.0	15	94.33
	2.0	118	63.53
	Total	133	
PAEI	1.0	15	110.77
	2.0	118	61.44
	Total	133	
PATA	1.0	15	104.33
	2.0	118	62.25
	Total	133	

PAIT - physical activity in transport, PAHG - physical activities for household and gardening, PAFT - physical activity in free time, PAWA - physical activity in walking, PAMI - physical activity of moderate intensity, PAEI - extreme intensity physical activity, PATA - total average physical activity, N – number of participants, Mean Rank – average numerical value assigned to the observations within the ranked data set.

**Table 2.** Kruskal Wallis test

Test Statistics <sup>a,b</sup>							
	PAIT	PAHG	PAFT	PAWA	PAMI	PAEI	PATA
Chi-Square	7.151	.016	18.270	6.097	8.507	26.823	15.867
df	1	1	1	1	1	1	1
Asymp. Sig.	.007	.898	.000	.014	.004	.000	.000

a. Kruskal Wallis Test

b. Grouping Variable: FACULTY GROUPS

df – degrees of freedom, Asymp. Sig. - the p-value of the chi-square that we have just calculated determines the statistical significance of the relationship that we have just tested, PAIT - physical activity in transport, PAHG - physical activities for household and gardening, PAFT - physical activity in free time, PAWA - physical activity in walking, PAMI - physical activity of moderate intensity, PAEI - extreme intensity physical activity, PATA - total average physical activity

## DISCUSSION

In an earlier study (Škovran, Cigrovski, Čuljak, Bon, Očić, 2020), the aim was to determine the difference in time spent in a sitting position and physical activity. It was conducted on two groups, or a total of 238 respondents, students from the Beijing Faculty of Sports (BSU) and students from the Faculty of Kinesiology in Zagreb (UNIZG). The results indicate that subjects from BSU sit more per day (380.30 minutes vs. 221.75 minutes) and that subjects from the Beijing Faculty of Sports are less active than those from the Faculty of Kinesiology in Zagreb (109.93 vs. 186.80).

In a study of the physical activity of students at the Faculty of Health Studies in Rijeka (Kaić, 2023), female students of the Faculty of Health Studies in Rijeka, using the IPAQ questionnaire, achieved a result of 4978 METs. Of particular concern is the fact that the research was conducted on students of health studies who should be promoters of healthy lifestyles.

Applying the international IPAQ questionnaire to Turkish students (Tasmektepligil, Agaoglu, Atan and Cicek, 2013) also compared the level of physical activity between students from the Faculty of Kinesiology and students from other departments. The research included a total of 200 students of other departments (19.70±1.27 years), of which 85 male and 115 female students, and 200 kinesiology students (20.17±1.68 years), of which 118 male and 82 female students. The research participants completed the short version of the IPAQ questionnaire. The results of the weekly level of physical activity for students of other departments amounted to 1612.46 MET-min/week (26.87 MET hour/week), and for Kinesiology students 5681.32 MET-min/week (94.69 MET hour/week), with a statistically significant difference ( $p < 0.01$ ).

255 female students participated in the research that determined the level of physical activity of female students of the Faculty of Kinesiology, Faculty of Medicine and Faculty of Teacher Education at the University of Zagreb (Mraković, Matković, Nedić, 2014) and the differences in physical activity between these groups, of which 78 female students of the Faculty of Kinesiology, 84 female students of the Faculty of Teacher Education and 93 students of the Faculty of Medicine. Physical activity was determined by Baecke's questionnaire, while univariate analysis of variance (ANOVA) revealed statistically significant

differences in the usual physical activity of female students from different faculties. It was established that female students of the Faculty of Kinesiology carry out daily physical activities, while female students of the Faculty of Teachers and the Faculty of Medicine lean towards a more sedentary lifestyle. As shown in the research conducted at our faculty, the level of physical activity among students from other departments is not sufficient, and they should be encouraged to engage in physical activities, while students of the Faculty of Kinesiology have no problems with it.

Motivating students to exercise is the purpose of this research with the intention of informing and presenting the level of physical activity to the student population and anyone who is interested. This applies not only to those who are committed to professional training in health and sports, but especially to those who previously did not have too many contact points with physical activities. We believe that it is important to examine the level and differences of the student population of Josip Juraj Strossmayer University in Osijek, to see where our students are compared to the rest of Croatia and Europe. The practical contribution of determining the level of physical activity is manifested in the fact that it is the initial step in the process of planning and implementing strategies focused on increasing the number of health-oriented physical activity programs. The use of exercise also contributes to greater satisfaction with physical appearance and has a positive effect on self-esteem.

## CONCLUSION

Based on the main results of this research and their comparison with the results of previous research, a statistically significant difference in the level of physical activity between female students of the first year of the Faculty of Kinesiology compared to female students of the first year of the Faculty of Economics was confirmed, which was also expected. The difference is reflected in the Total average physical activity (PATA) variable, where female students of the first year of the Faculty of Kinesiology have statistically significantly higher values compared to female students of the first year of the Faculty of Economics. It is also reflected in the variables Physical activity in transport (PAIT), Physical activity in free time

(PAFT), Physical activity of moderate intensity (PAEI).  
(PAMI) and Extreme intensity physical activity

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