PHYSICAL ACTIVITY LEVEL OF POLICE UNIVERSITY STUDENTS ACCORDING TO IPAQ: A PILOT STUDY

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Abstract: The aims of research were to determine the Police University students' level of physical activity as well as to determine the differences in relation to gender. The total sample consisted of 60 subjects (30 male and 30 female). For assessing the levels of physical activity International Physical Activity Questionnaire (IPAQ) was used. Based on IPAQ scores (MET), the level of physical activity is classified as high, moderate and low. Results of descriptive statistics showed that the average value for a male student was 8157.63 ± 3365.00 MET, while for a female one it was 3793.57 ± 3152.80 MET. ANOVA results showed that there is a statistically significant difference between genders at the general level (F = 26.870, p = 0.000), as well as at the partial level for high (F = 21.229, p = 0.000) and moderate (F = 31.898, p = 0.000) level of physical activity in favor of males.

Keywords: Police students, physical activity, Questionnaire

INTRODUCTION

Physical activity (PA) includes a wide range of activities such as playing, physical exercise, competitive sports, physical effort during professional activities, doing household chores, in a word, any type of physical work (Cvetković, 2012). Caspersen, Powel & Christenson (1985) defined PA as a movement performed by skeletal muscles that requires energy consumption and described by four dimensions: frequency, duration, intensity and type of physical activity. Also, regular PA exercise can be associated with three aspects of health: physical, mental and social (Berčić & Đonlić, 2009).

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PA, even in the young population, increases the level of good - HDL and reduces the level of bad - LDL cholesterol, prevents the development of atherosclerosis, osteoporosis and cardiovascular diseases, increases respiratory volume, increases self-confidence and a sense of satisfaction and contributes to stress reduction (Rakić, 2017). The American College of Sports Medicine (1993) recommends daily PA (minimum of 3-5 days per week), where exercise intensity should be on the level of 65-80% of the maximum heart rate (HRmax) or 50-85% of the maximum oxygen consumption (V0$_{2max}$), with a duration of 20-60 minutes of continuous aerobic physical work. An activity that engages large muscle groups continuously in aerobic mode is also recommended: walking, rope jumping, hiking, running, jogging, rowing, cycling, dancing, stairs climbing, swimming and skating. The American Center for Disease Control and Prevention recommends 30 minutes of physical activity of at least moderate intensity, if not daily then on most days of the week (150 kilocalorie - kcal per day), where activities can be summarized multiple times in episodes of minimum continuous duration of 10 minutes (Pate et al., 1995). The World Health Organization recommends a minimum energy expenditure of 600 MET-minute/week for all adults, which is equivalent to 150 minutes of moderate aerobic physical activity per week (WHO, 2018).

Inactivity or insufficient PA, on the other hand, is a condition in which there is no significant increase in energy consumption above that at rest (Hagströmer, Oja & Sjöström, 2007). According to the WHO (2018), insufficient PA is physical activity where energy consumption is less than 600 MET-minute/week. Also, WHO declared insufficient PA - hypokinesia as an independent health risk factor (Hass, Feigenbaum & Franklin, 2001; Mitić, 2001), while physical inactivity was categorized as the biggest public health problem in the 21st century (Blair, 2009).

Previous research indicates that young people spend more and more of their free time in a sedentary mode - in front of a computer or television (Nelson, Neumark-Stzainer, Hannan, Sirard & Story, 2006; Greaney et al., 2009). A critical point in young people PA decline occurs during the transition from high school to college (Small, Bailey-Davis, Morgan & Maggs, 2012; Cocca, Liukkonen, Mayorga-Vega & Viciana-Ramírez, 2014). The beginning of the study process for the most of young people is a sensitive period, in which the level of PA decreases and the number of activities that do not require physical effort increases (De Vahl, King & Williamson 2005). Although students are aware of PA's health benefits, most do not engage in any physical activity (Vračan, Pisačić & Slačanac 2009).

The University of Criminal Investigation and Police Studies in Belgrade (UCIPS) is an educational institution that educates various profiles of the police profession. The UCIPS educates students to work in the Republic of Serbia police through three departments: the Department of Criminology, the Department of Forensic Engineering and the Department of Information Technology. At the Department of Criminology, in addition to other subjects, students also attend classes in the subject of Specialized Physical Education (SPE), (Blagojević, Vučković, Koropanovski & Dopsaj, 2017). However, SPE classes take place during the first three years of study and only in one semester of each school year. Practically, during the calendar year, students are systematically physically active for three months only. Additionally, in the final, fourth year of study, students do not have SPE classes at all. Students' PA in free time can be one of the factors that determine the level of motor abilities in the period when there is no organized physical activity, but it could also have a positive impact on the level of basic motor abilities that is required on the colloquium on the subject of SPE. More widely, practicing regular physical activities after graduation can contribute to the development of positive life habits related to health status and efficient policing. Therefore, the aims of this research were to determine the UCIPS students' level of physical activity in free time, as well as to determine the differences in relation to gender.

METHODS

The sample

The total number of respondents was randomly selected so as to include 60 UCIPS students from all years of study. Out of the total number of respondents, 30 female and 30 male students were included; whose average age was 20.05 years. All respondents were informed about the object and purpose of the research. The research was conducted in accordance with the terms of "Declaration of Helsinki for recommendations guiding physicians and biomedical research involving human subjects" - (http://www.cirp.org/library/ethics/helsinki/), as well as with the permission of the Ethics Committee of the Faculty of Sport and Physical Education, University of Belgrade.

Testing procedure

A short form of the International Physical Activity Questionnaire - IPAQ (2005) was used in this research. IPAQ is a standardized universal instrument for the assessment of the health-related PA of the adult population and adolescents aged 15-19 years (Craig et al., 2003). The questionnaire assesses the frequency, duration, and intensity of PA in four domains of human life: leisure time, domestic and gardening (yard) activities, work-related and transport-related physical activities. The questions focus on the time spent in a particular type of PA in the last 7 days and provide separate scores for each type of activity. Calculating the total score of the IPAQ requires summing the duration (in minutes) and frequency (in days) of all three types of physical activity (Hagstromer et al., 2006; Alexander, Bergman, Hagstromer & Sjostrom, 2006; Papathanasiou et al., 2009). The level of PA is estimated through the total energy consumption expressed in metabolic equivalents (Metabolic Equivalent of Task - MET). 1 MET represents the basal level of oxygen consumption and the associated caloric expenditure, corresponds to the level of metabolism in rest, with values around 3.5 ml/kg/min or 1 kcal/kg/h (Howley, 2000; Warren et al., 2010). Based on the responses of each respondent, MET-minutes/week was calculated for each of the mentioned levels of PA. After calculating the total energy consumption expressed in MET-minutes/week, the respondents were grouped into one of three groups: LOW (<600 MET-minutes/week), MODERATE (601-3000 MET-minutes/week) and HIGH (>3000 MET -minutes/week) PA level group (Craig et al., 2003). The questionnaire also estimates the time spent in lying and/or sitting (LY/SIT). The short form of the IPAQ showed good results in the possibility of repeating and comparing the research results at the international level (Alexander et al., 2006; Dinger, Behrens & Han, 2006; Papathanasiou et al., 2009).

Statistical analysis

All data were analyzed using the descriptive statistics to calculate the basic parameters of central tendency: arithmetic mean (MEAN), standard deviation (SD), minimum (Min) and maximum (Max) values and standard error of the arithmetic mean (Std.Err). The existence of statistically significant differences between the groups at the general (Σ) and partial level (LOW, MODERATE and HIGH) of the observed space was determined by applying the univariate analysis of variance (ANOVA). Statistical significance was defined at 95% probability, i.e. at $p<0.05$ level (Hair, Anderson, Tatham & Black, 1998). All statistical analyses were done by the application of software package SPSS Statistics 17.0.

RESULTS

The results of the descriptive statistics are shown in Table 1.

Table 1. *Results of descriptive statistics*

MET		N	MEAN	SD	Std. Err.	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
Σ	Male	30	8157.63	3365.00	614.36	6901.12	9414.14	2016.00	18372.00
	Female	30	3793.57	3152.80	575.61	2616.29	4970.84	.00	12318.00
LOW	Male	30	2170.30	1002.53	183.03	1795.94	2544.65	396.00	4158.00
	Female	30	1802.90	1533.10	279.90	1230.43	2375.36	.00	4158.00
MOD-ERATE	Male	30	1895.33	1191.29	217.50	1450.49	2340.17	360.00	5040.00
	Female	30	508.00	625.27	114.15	274.51	741.48	.00	2400.00
HIGH	Male	30	4092.00	2533.73	462.59	3145.89	5038.10	480.00	13440.00
	Female	30	1482.67	1789.44	326.70	814.47	2150.85	.00	5760.00
LY/SIT	Male	30	118.00	51.02	9.31	98.95	137.06	60.00	240.00
	Female	30	354.00	156.26	28.53	295.65	412.35	60.00	600.00

The results of ANOVA at the general and partial level between the genders are shown in Table 2.

Table 2. *Results of ANOVA*

		Sum of Squares	Mean Square	F	Sig.
Σ	Between Groups	2.85	2.85	26.870	**.000**
	Within Groups	6.16	10631697.10		
	Total	9.02			
LOW	Between Groups	2024741.40	2024741.40	1.207	.277
	Within Groups	97309047.00	1677742.19		
	Total	99333788.40			
MO-DEATE	Between Groups	28870406.66	28870406.66	31.898	**.000**
	Within Groups	52494626.66	905079.77		
	Total	81365033.33			
HIGH	Between Groups	1.02	1.02	21.229	**.000**
	Within Groups	2.79	4810928.73		
	Total	3.81			
LY/SIT	Between Groups	835440.00	835440.00	61.837	**.000**
	Within Groups	783600.00	13510.34		
	Total	1619040.00			

Figure 1 shows the percentage distribution of respondents of both genders according to the type of PA in their free time.
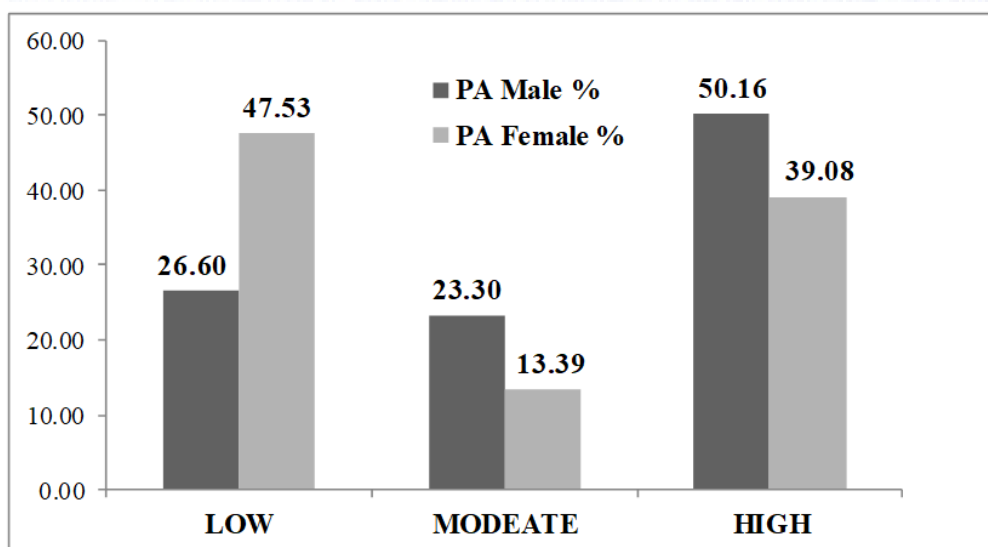
Figure 1. *Respondents percentage distribution*

DISCUSSION

From the results of descriptive statistics (Table 1) for the sample of male respondents, whose total MET value was 8157.63 ± 3365.00, it can be concluded that on general level, they belong to the population with a high level of PA. At the partial level, on the basic of descriptive indicators of different levels of PA shown through the percentage distribution in Figure 1, we can conclude that students spend their free time mostly in high (intensive) PA - 50.16%. After high, students most often practice low-intensity PA in 26.60%, while in the lowest percentage they practice medium-intensity PA - 23.30%. In a study conducted on a sample of students from the Faculty of Physical Education and Sports of the Alexandru Ioan University in Romania, it was found that the average PA level was 5993.69 MET (Fagaras, Radu & Vanvu, 2015), while among students from the University of Physical Education in Krakow - Poland average PA level was 6308 MET (Bednarek, Pomykała, Bigosińska & Szyguła, 2016). The results of the research among students of the National University of Lutsk in Ukraine showed that the average PA was 3863 MET (Bergier, Tsos & Bergier, 2014), while among Croatian students it was 2960 MET (Pedišić, 2011). Comparing the results of this research with the results of previous research, it can be concluded that UCIPS students practice PA in accordance with physically active student populations, while their results are better compared to the results of students whose professional orientation is not directly related to physical activities.

In the sample of females, based on the obtained results of descriptive statistics which showed that at the general level the average value of MET was 3793.57 ± 3152.80 (Table 1), it can be concluded that the respondents belong to the group with a high level of PA. Based on the percentage distribution shown in Figure 1, it can be concluded that female students in the highest percentage engage in low-intensity physical activity in 47.53%, then high-intensity PA - 39.08%, while in the lowest percentage - 13.39% exercise medium-intensity PA. The research on physically active student populations found that female students of the Faculty of Physical Education and Sports of Alexandru Ioan University achieved 4303.28 MET (Fagaras et al., 2015), female students of the Faculty of Physical Culture, Palacký University, Olomouc - Czech Republic had 5296 MET (Zhao, Sigmund, Sigmundová & Lu, 2007), while among female students of the Faculty of Kinesiology at Corum Hitit and Samsun On-

dokuz Mayis University - Turkey, it was 4319.16 MET (Tasmektepligil, Agaoglu, Atan & Cicek, 2013). Results for female students of "other" faculties were 1981 MET at Beijing university in China (Zhao et al., 2007), 2707 MET for female students in Croatia (Pedišić, 2011) and 1386.69 MET for Turkish female students (Tasmektepligil et al., 2013). Comparing the results of this and previous research, it can be concluded that UCIPS students have higher MET values compared to the sample of "ordinary" female students, while their results are slightly lower compared to physically active student populations. Additionally, students enrolled at sports-centric universities may have higher levels of physical activity than students enrolled at traditional universities, where physical education faculties are not the central focus of education (Bednarek et al., 2016). The obtained results at the general level, both for male and female respondents, may be a consequence of the fact that UCIPS students belong to the population of physically active persons. More precisely, UCIPS students were selected, among other things, in relation to the level of basic motor abilities, and due to the subject of SPE, they belong to the physically active population (Vučković & Dimitrijević, 2013). Also, a high level of PA in free time can be associated with the need to maintain and improve the level of basic motor abilities for taking the colloquium on the subject of SPE.

The results of ANOVA showed that there is a statistically significant difference between genders at the general level (F = 26.870, p = 0.000), as well as at the partial level for high (F = 21.229, p = 0.000) and moderate (F = 31.898, p = 0.000) level of physical activity in favor of males (Table 2). It was also found that females spend statistically significantly more of their free time in lying/sitting (Table 2). From the obtained results, it can be concluded that male students are more physically active in their free time compared to females. This conclusion is consistent with previous studies in which the same or similar results were found (Fagaras et al., 2015; Clemente, Nikolaidis, Lourenco-Martins & Mendes, 2016). The explanation for differences in PA levels between the genders could be different motives for engaging in physical activity (Maltby & Day, 2001). In males, the motives for exercise are internal factors such as challenge and enjoyment, while females are motivated by external factors, which are the improvement of physical appearance and weight reduction (Duncan, Hall, Wilson & Jenny, 2010; Egli, Bland, Melton & Czech, 2011). Regardless of motivational factors, since UCIPS students are trained to perform police tasks that require a high level of motor abilities, it can be concluded that there is a need for additional education/motivation efforts aimed to engage in physical activities, especially with the female population. Confirmation of such conclusion also lies in the fact that compared to males, females are more susceptible to injury due to anthropological specifics (De Loës & Jansson, 2002), in terms of physical abilities have lower indicators of strength (Boyce, Willett, Mullins, Jones & Cottrell, 2014), lower general and specific skills (Birzer & Craig, 1996), and are more often exposed to the risk of professional and social discrimination (Spasić, 2008).

CONCLUSION

The aims of this research were to investigate the students' level of physical activity in free time, as well as to determine the differences in relation to gender. The research was conducted on a sample of 60 students divided in two groups - one group of 30 male and one group of 30 female respondents. The results showed that both groups belong to the population with a high level of physical activity. The results also showed statistically significant differences between groups on the general and on the partial level for high and moderate level of PA in favor of males. It was determined that females spend statistically significantly more time in lying/sitting. The males spend most of their free time in high-intensity physical activity, followed by low-intensity and at least in moderate-intensity physical activity. As for the females, the low-intensity level of physical activity is the most common, followed by high

and moderate-intensity physical activity. Based on these results, there is a need for the new research that will determine the exact reasons for the differences found between the groups. The final goal of further research should be related to the improvement of educational and/or motivational processes in the field of physical activities in UCIPS students' free time.

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