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PHYSICAL ACTIVITY LEVELS OF SARAJEVO UNIVERSITY STUDENTS

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Original research:

Abstract
The transition from secondary school to university is often accompanied by unhealthy behavior changes such as decreasing physical activity and increasing sedentary behavior. Therefore, the aims of this study were to provide preliminary IPAQ scores among Sarajevo University students and compare them by gender. 103 students aged 22,32±1,90, who did not participate in additional trainings and/or organized physical activities were included in this study. Croatian version of Physical Activity Questionnaire (long IPAQ self-evaluation questionnaire) was used to evaluate respondent's physical activity levels. The results indicate that the student population is most involved in moderate activities, both on a weekly and daily basis. In all variables representing physical activity, higher values were observed in male students, while female students had higher values in sitting. The results presented in this study showed that it is necessary to continuously take measures for promoting the sport at each University in Bosnia and Herzegovina (not only on Faculty of sport and physical education) with the aim of raising the health status of students to a higher level.

Key words: *sedentary lifestyle, obesity, exercise, health, quality of life*

Introduction

The level of physical activity (PA) in the adolescent age is declining, and excessive body mass and obesity are growing and are one of the biggest global problems around the world. Low levels of PA and overweight annually take 2.8 million lives (World Health Organization, 2013). Human health significantly depends on the level of physical activity (PA) and healthy nutrition (Concha-Cisternas et al., 2018). Scientists indicate that PA should be systematic and regulated by age-appropriate exercise intensity (Bergier et al., 2018). A detailed study of students PA level is vital for assessing the health status of future social elites of society (Bergier et al., 2018). The research data suggests that many students do not meet the PA recommendations of the World Health Organization (Juškelienė & Česnavičiene, 2017). The World Health Organization (WHO) recommends at least 60 minutes of moderate- to vigorous-intensity physical activity daily for young people to accumulate. The main reasons for the lack of PA of students include a heavy study load and enthusiasm for the internet and computer games (Kudryavtsev, Kramida, & Osipov, 2016). Bray & Born (2004) appreciate that one third of active students in high school became insufficiently active upon transitioning to university life. Some international studies show a high rate of physical inactivity represented in leisure time, in the European countries, which move in the range of 35% to 89% (Haase, Steptoe, Sallis, Wardle, 2004). The transition from secondary school to university is often accompanied by unhealthy behavior changes such as decreasing physical activity and increasing sedentary behaviour (Crombie et al., 2009; Vella-Zarb et al., 2009). Many scientists point out that higher physical activity levels are associated with lower health risks (including overweight and obesity related diseases). Compared with those who are inactive, physically active youth have higher levels of fitness, lower body fat, stronger bones and muscles and lower risk of cardiometabolic diseases (U.S. Department of Health and Human Services, 2008). It is noted that systematic, science-based exercise can significantly influence not only the regulation of morphological, motor and functional characteristics, but also to a significant extent the cognitive functions and conative dimensions responsible for behavioral modalities and effect young people socialization (Chan et al., 2019) There is no such activity that can simultaneously affect as many human traits like professionally designed physical exercise program (Alamdari et al. 2019), but it is important to emphasize that the total amount of physical activity in the education system is insufficient and does not ensure optimal transformational effects (Prskalo et al. 2010). To collect data on the daily PA level of students, scientists use a variety of survey methods. In recent years, the International Physical Activity Questionnaire (IPAQ) has become a common tool (Loginov, Nikolaev, Vetoshnikov, & Sagadeeva, 2015). Croatian version of

the long IPAQ self-evaluation questionnaire is reliable for measuring the level of specific activity for different areas and intensity of physical activity (Pedišić, Jurakić, Rakovac, Hodak, Dizdar, 2011).

Methods

Respondents sample

The research included 103 students from Faculty of sport and physical education, University of Sarajevo aged 22,32±1,90, who do not participate in additional trainings and/or organized physical activities. Respondents gave their written consent after receiving information's concerning the study. Full ethical approval for this study has been obtained from the Research Ethics Committee of Faculty of sport and physical education.

Measures

In order to determine the level of physical activity among adolescents at this age, the International Physical Activity Questionnaire long form (IPAQ) was used. IPAQ describes physical activity in energy expenditure units – minutes per week (MET). Metabolic equivalent of task (MET) is used to estimate the metabolic cost (energy expenditure as reflected by oxygen consumption) of PA – resting metabolic rate. According to scientific reports, one MET is equal to approx. 3.5 ml oxygen kg−1 body weight per min−1. It was determined that the cost of an intensive physical effort is 8 MET per minute, a moderate effort – 4 MET, walking (march, quick walking) – 3.3 MET. The energy cost of the PA is calculated as the MET level multiplied by the standard resting metabolic rate (1.0 kcal/kg/h). Only the PA lasting longer than 10 minutes was estimated, without rest breaks, and within the last 7 days prior to survey. The specific types of activity that are assessed in the study are walking (W), moderate-intensity activities (M) and vigorous-intensity activities (V) (assuming that a vigorous-intensity PA is a hard physical effort which forces strongly intensified respiration and considerably accelerated heart rate, a moderate-intensity PA means physical effort with slightly accelerated and make you breathe somewhat harder than normal and slightly accelerated heart rate. Weekly PA was calculated by summing-up the MET obtained during vigorous-intensity PA, moderate-intensity PA and while walking during the entire week (Ćosić Mulahasanović et al., 2018). In the methodology of the assessment of the category score of weekly PA of the IPAQ, the following 3 categories were selected:

1. LOW PA - when the total energy expenditure does not reach 600 MET in/week.
2. MODERATE PA - assuming that this expenditure is the effect of 3 or more days of vigorous-intensity PA for a minimum of 20 minutes daily; 5 or more days of moderate-intensity PA and/or walking for at least 30 minutes per day; 5 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total PA of at least 600 MET-minutes/week.
3. HIGH PA – assuming that this expenditure is the effect of vigorous-intensity activity on at least 3 days achieving a minimum total PA of at least 1500 MET-minutes/week; 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total PA of at least 3000 MET-minutes/week.

Data analysis

Results were analyzed using SPSS 25 (IBM, Armonk, NY, USA) for Windows. Descriptive statistics (Mean – arithmetic mean, SD – standard deviation, Median and Frequencies in percent (%) were calculated for each university's participants. Normality of the findings was analyzed using the Kolmogorov Smirnov (KS) test). Significance (p) for all statistical tests was set at $p \leq 0.01$. Significant differences between genders were assessed using Mann-Whitney U tests.

Table 1. Physical activity levels and Mann-Whitney U between genders

	MET	MET Day	Walking	Walk Day	Mod	Mod Day	Vigs	Vig. Day	Sit	Sit Day
Mean	31322,77	4474,68	3870,69	552,96	16093,74	2299,11	11358,34	1622,62	2235,23	319,32
Median	1439,14	3085,5	440,78	2700	385,71	4800	685,71	2400	2400	342,86
St.	26377,05	3768,15	3442,80	491,83	13958,35	1994,05	12315,68	1759,38	1002,98	143,28
Mean Rank M	60,66		54,91		60,23		58,50		40,47	
Mean Rank F	36,40		41,25		35,46		31,66		53,43	
Mann-Whitney p	<0,001		0,016		p<0,001		p<0,001		0,022	

Results

The Kolmogorov Smirnov (KS) test showed all variables deviated significantly from the expected normal distribution (p< 0,20). Table 1 indicates descriptive

statistics and gender differences in respondents PA level. There were statistically significant gender differences.
The results from Table 1 indicate that the student population is most involved in moderate activities, both on a weekly and daily basis. Furthermore, in all variables representing physical activity, higher values were observed in male students, while female students had higher values in sitting.

Discussion

The results showed that the student population spends 319 minutes per day on sitting which is approximately 3.5 hours. This indicator is understandable, given the type of activities they engage in. The learning process that is the primary activity of the student population is most often realized in this way. Although it is not directly measured, it can be assumed that female students learn more than male students. Until this date, not many articles on this topic have been published in Bosnia and Herzegovina. However, the only published study (Ćosić Mulahasanović et al., 2018), which dealt with student population PA issue, showed some different results. In fact, both, the total level of physical activity (PA) and individually compared results are significantly lower compared to this study. Results in region (Croatia) are also lower (Pedišić et al., 2014). In some other countries such as China (Zhao et al., 2007) and Turkey (Bednarek et al. 2016), although they record better results than the regional one, some even better than those recorded in our country. But for example, Poland (Bednarek et al. 2016) has results that are lower than these in our study. The differences in the results of our and most previous studies lie in the fact that: 1) respondents in our study are mostly students of the Faculty of Sports and Physical Education, 2) respondents in our study predominantly have more hours of sports and recreational activities than students of other faculties, 3) teaching courses at the Faculty of Sports and Physical Education are specific and different from other faculties of the University of Sarajevo. By further analysis of the results, we can determine with certainty that the results of our study fully agree with most previous studies. (Pedišić et al., 2014; Zhao et al., 2007; Bednarek et al. 2016), so the weekly level of physical activity is higher in male students than in female students. However, identifying the reasons why this difference occurs could contribute to increased levels of physical activity in the female population. Choi et al (2015) noted that the level of physical activity depends very much on the level of social support, both institutional and non-institutional. Future research could be directed in institutional direction, because no similar ones can be found in B&H. Considering women present higher rates of chronic debilitating conditions such as arthritis, frequent or severe headaches, gallbladder conditions, and also more internalizing mental problems such as affective and anxiety disorders (Matud, 2017), it is very important to encourage the female part of the population to engage in more intense physical activity from the earliest days.

Conclusion

The results show a high level of physical activity in the student population, predominantly students of the Faculty of Sports and Physical Education. Female students have a lower level of physical activity than men, which can be associated with various chronic diseases listed in the paper. Therefore, it is necessary to find reasons and methods to reduce these differences. The results presented in this study showed that it is necessary to continuously take measures for promoting the sports at each University in Bosnia and Herzegovina (not only on Faculty of sport and physical education) with the aim of raising the health status of students to a higher level.

Limitations and Future research

This study has several limitations. First, this study was cross-sectional in only one Faculty (Faculty of sport and physical education, University of Sarajevo), so these students are dominant in sample. Participation in this study was based on the voluntary base, which precludes analyses of some of PA determinants among the full range of the PE student sample. In addition, PA data were self-reported, meaning they may be over-or underestimated. Therefore, future research that includes empirical measurements using objective methods is needed. It is necessary to do a study at the entire University of Sarajevo and based on these results it is possible to create specific guidelines for PA.

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