Sport SPA Vol. 19 Issue 1: 37-41
DOI: 10.51558/1840-4561.2022.19.1.37

# ANALYSIS OF DIFFERENCES BETWEEN MALE AND FEMALE STUDENTS IN THE PHYSICAL ACTIVITY ASSESSMENT TEST IPAQ

Ivana Ćosić Mulahasanović[1], Amra Nožinović Mujanović[1] Edin Mujanović[1], Alem Šabović[2], Ivan Ledić[2]

*[1]Faculty of Physical Education and Sport, University of Tuzla, Bosnia and Herzegovina*
*[2]PhD student in kinesiology*

Original scientific paper

**Abstract**
We examine differences between students in physical activity levels at the University of Tuzla. Physical activity was measured using the International Physical Activity Questionnaire (IPAQ long form). Results of the Mann-Whitney U test for physical activity assessment shows that male students achieved higher levels of physical activity at a statistically significant level in four out of a total of seven variables.
**Keywords:** students, physical activity, IPAQ

## INTRODUCTION

Physical activity is defined as any movement of the body that is performed by activating skeletal muscles and results in energy consumption (Caspersen, Powell, and Christenson, 1985). Defined by the World Health Organization (WHO), physical activity includes all movements, i.e. movement in everyday life, including work, recreation and sports activities, and is categorized according to the level of intensity from low to moderate to vigorous, i.e. high intensity.

At the University of Tuzla, for more than 15 years, the Faculty of Physical Education and Sport, with the aim of preventing obesity, has been organizing and conducting two physical activity classes for all faculties, in such a way that first-year students were offered a variety of sports that they could choose to do recreationally, with the aim of maintaining health and preventing injuries and diseases, as well as a happier life span. It is common knowledge that physical activity can reduce risks while building healthier bones and muscles, reduce obesity, stress, anxiety and promote well-being and a healthier lifestyle (Chobaniev et.al.2003; El Gilany et.al. 2011.)

The topic of this research arose from the desire to contribute to solving part of the global health problem, which requires the involvement of all experts in the field of kinesiology and medicine in the promotion of physical activity (Bronikowski et.al., 2008). It is also an urgent need of our social community, which as a rule does not pay enough attention to the psychophysical aspect of the development of young people, who through the education system have the right and the opportunity to develop into responsible and mature persons, i.e. persons who would carry out a healthy transformation from adolescence to early adulthood (Lebedina-Mazoni et.al.,2008).

Previous research has confirmed that this is a risky period of growing up which leaves consequences (Gusy et.al., 2012; Mir et.al., 2012, 2013). It is about young people who, in a new life chapter, face numerous challenges from orientation in the study system, attending lectures, colloquiums, partial exams, staying in the library and reading room, continuing through a change of place of residence and residence, surrounded by new people, with an independent financial budget which, in addition to lack of time, can cause bad eating habits, lack of variety of food, consumption of fast food, skipping meals to the burden caused by the search for social identity with the desire for a beautiful and satisfactory appearance, because there is also a period of independence from parents and the search for role models from the environment and wider that they can look up to (Keller et.al., 2008; Garber et.al., 2011; BMWF, 2012; Dreger & Huber, 2013; Mir et.al., 2015).

Gender differences are interesting considering that many previous studies point to different attitudes of men and girls towards physical activity, and that girls and young women are much less willing to participate in different physical activity programs of a regular, chronic nature, unlike men. Namely, the participation rate of the female sex in more physically active programs, which should be started and accepted as early as early childhood and as much as possible, is far below average. (Markuš et.al., 2008.)

In this new life chapter, freshmen face numerous university challenges, such as orientation in the study system, colloquiums and partial exams, attendance at lectures, change of place of residence and residence during studies, independent financial budget, business activities, and all that, are just some of the potential

emerging themes in their life and with which they encounter. Therefore, such research can be helpful in solving similar problems (Ivana et al 2018, Mir et.al. 2015).

## MATERIAL AND METHODS

### *Participants*

The study was conducted on a sample of 813 students 1st cycle of studies at the University of Tuzla. All students were healthy with no previous medical condition to prevent them from being physically active and to complete the surveys. Out of the total number of students 321 were male (mean age 20.07±1.027) and 492 female (mean age 19.91± .637) of the first year of study. At the beginning of the academic year, students through the subject physical education are offered a range of sports which could be recreationally engaged in, by free choice, with the aim of maintaining health and preventing injury and illness, as well as a happier life span. Student's freshmen at the Faculty of Physical Education and Sports, are not included in this study due to the fact that their faculty program is focused on physical education and sports and they have an advantage over hours spent in PA, at least 4 times a week. The survey protocol was approved by the Scientific Committee of Faculty of Physical Education and Sports, University of Tuzla. The study was voluntary and no incentives were paid to the students.

### *Instrument*

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 an 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. In the methodology of the assessment of the category score of weekly PA of the IPAQ, the following 3 categories were selected:
LOW PA - when the total energy expenditure does not reach 600 MET in/week. 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.
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.

### *Procedure*

The measurement protocol was the same for all faculties. When arriving at the sports hall participants took the survey questionnaires and after explanation and detailed information about the research, objectives and mode of implementation, and that at any moment can turn to for help with possible ambiguities they started to answer the questions. The participants faculty, age and sex were also recorded. Since the survey was anonymous, prior to the start of the survey, respondents were asked to complete the questionnaire as accurately and honestly as possible.

### *Data analysis*

Analysis of the data was processed using a software system for data. Significance (p) for all statistical tests was set at $p \leq 0.01$. Significant differences between groups were assessed using Mann-Whitney U tests.

## RESULTS AND DISCUSSION

Looking at the results of the Mann-Whitney U test for physical activity assessment variables in Table 1, we see that there were statistically significant differences between male and female students in four out of a total of seven variables. A statistically significant difference was obtained in the variable for assessing physical activity in transport-TAPR at

the significance level of p=.005, then in the variable for assessing physical activity in free time-TASV at the significance level of p=.000, the variable for assessment vigorous-intensity physical activities-TAIN at the level of significance p=.000 and variables for the assessment of total physical activity-UPTA at the level of significance p=.008. When we analyze the results of mean rank values (Mean Rank), we see that in all statistically significant variables, the result values speak in favor of the first group (male students), that is, in the mentioned variables, male students achieved higher levels of physical activity at a statistically significant level. According to the obtained results, research also speaks for the domain of transport (Sliško, 2015), for the domain of free time (Jurakić, 2009; Bauman, 2012; Reed, Phillips, 2005), for physical activity of vigorous-intensity (Miller, et al., 2005) and for the overall physical activity of students (Lapa, 2015; Bergier, Bergier, Tsos, 2016) in relation to gender, as well as many other studies.

Table 1. Results of the Mann-Whitney U test between male and female students in the physical activity assessment test expressed in MET-min/week

| | Male1/ Female2 | Mean Rank | p-value |
|---|---|---|---|
| TAPR | 1 | 434.98 | **.005** |
| | 2 | 387.88 | |
| TADV | 1 | 393.07 | .185 |
| | 2 | 415.28 | |
| TASV | 1 | 456.70 | **.000** |
| | 2 | 373.68 | |
| TAHO | 1 | 414.48 | .433 |
| | 2 | 401.28 | |
| TAUI | 1 | 416.85 | .308 |
| | 2 | 399.73 | |
| TAIN | 1 | 465.30 | **.000** |
| | 2 | 368.06 | |
| UPTA | 1 | 433.66 | **.008** |
| | 2 | 388.74 | |

Lower statistically significant physical activity in women, in the variable total physical activity, was confirmed compared to men. Men, unlike women, achieved a statistically significant higher result in the domains of physical activity in transport and physical activity in free time, while women achieved a higher result of the mean values of ranks in the domain of physical activity in the household and gardening, which is in accordance with the study on the population Polish students. (Bergier, Bergier, Tsos, 2016).

The obtained results of students in relation to gender also indicate a statistically significant higher level of physical activity of vigorous-intensity in men, which is in accordance with research (Miller, et al., 2005), as well as that the higher mean values of the ranks in the variable physical activity walking and physical activity of moderate intensity are in favor of men as opposed to women. What is still interesting is the constant presence of greater physical activity in men compared to women (Miller et al., 2005), a trend that continues despite changes in society and traditional gender roles. Studies show that physical activity of an vigorous-intensity is significantly reduced among students in their first year of college (Bray, 2004; Dart, 2008).

University students are a very important target group because it is known that between 30-60% of them are insufficiently active (Irwin, 2004). Furthermore, studies indicate that the transition between high school and college is possibly associated with a significant decrease in physical activity (Bray, Born, 2004). Regular physical activity and exercise at this age can be associated with a higher quality of life (Pedišić et al., 2013; Rakovac et al., 2013) and greater sustained maintenance of physical activity. (Sparling, Snow, 2002). Less physical activity was observed in girls, in earlier years of study, in those from smaller communities, smokers, lower financial status, and those who consume alcohol. (Sliško, 2015; Pedišić, 2014; Abdullah, 2005; Musselman, 2010).

## CONCLUSION

The results of present study showed statistically significant differences between male and female students in four out of a total of seven variables. It indicates that it is necessary to continue and intensify actions in the area of promotion of various forms of physical activity and need for modifications of the study curriculum by adding additional sport classes in order to increase the interest for more sufficient physical activity of both male and female students.

## REFERENCES


1. Abdullah, AS., Wong, CM., Yam, HK., Fielding, R. (2005). Factors related to non- participation in physical activity among students in Hong Kong. Int J Sports Med, sept.; 26 (7):611-615.
2. Bauman A.E., Reis R.S., Sallis J.F., Wells J.C., Loos R.J.F., Martin B.W. (2012) Correlates of physical activity: Why are some people physically active and others not? The Lancet, 380(9838), 258-271. doi.10.1016/S0140-6736(12)60735-1.
3. Bergier J., Bergier B., Tsos A. (2016). Variations in Physical Activity of Male and Female Students from Different Countries. Iran J Public Health, Vol.45, No.5, pp. 705-707.
4. BMWF (Hrsg.) (2012): Bericht. Materialien zur sozialen Lage der Studierenden 2012. Wien. Verfügbar unter: http://www.bmwf.gv.at/uploads/tx_contentbox/ Materialien _ soziale_Lage_2012.pdf <25.09.2012>.
5. Bray, S.R., Born, H.A. (2004). Transition to university and vigorous physical activity: Implications for health and phychological well-being. *Journal of American College Health,* 52(4):181-188. Doi:10.3200/JACH.52.4.181-188.
6. Bronikowski, M., Gonzales-Gross, M., Kleiner, K., Knisel, E., Martinkova, I., Stache, A., Kantanista, A., Lopez, D.C., Konlechner, A. (2008). Physical activity, obesity and health programs in selected European countries. *Studies in Physical Culture and Tourism*, *15*(1), 9-17.
7. Caspersen, C.J., Powell, K.E., Christenson, G.M. (1985). Physical activity, exercise, and physical fitness: Definitions and distictions for health related research. Public Health Reports 100(2), 126-130.
8. Chobanian, A. V., Bakris, G. L., Black, H. R., Cushman, W. C., Green, L. A., Izzo, J. L., Jr, Jones, D. W., Materson, B. J., Oparil, S., Wright, J. T., Jr, Roccella, E. J., National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, & National High Blood Pressure Education Program Coordinating Committee (2003). The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA*, *289*(19), 2560–2572. https://doi.org/10.1001/jama.289.19.2560
9. Ćosić Mulahasanović, I., Nožinović Mujanović, A., Mujanović, E., Atiković, A. (2018). Level of Physical Activity of the Students at the University of Tuzla According to IPAQ. *Central European Journal of Sport Sciences and Medicine*, *1* (21), 23–30. DOI: 10.18276/cej.2018.1-03.
10. Dart, L., Davis, M. (2008). Vigorous physical activity patterns among college students. TAFCS Research Journal, 1(1), 22-24.
11. Dreger, S., Huber, G. (2013): "Generation S" – Sitzender Lebensstil bei Kindern und Jugendlichen. In: peb-Transfer Wissen für die Praxis (1), 1–6, Stand: 24/02/2013.
12. El-Gylany, A.H., Badawi, K., El-Khawaga, G., Awadalla, N. (2011). Physical activity profile of students in Mansoura University, Egypt, *Eastern Mediterranean Health Journal,* 17(8):694-702.
13. Garber, D. E., Blissmer, B.,Deschenes, M. R., Franklin, B.A., Lamonte, M.J., Lee, I-M., Nieman, D.C., Swain, D.P. (2011): Quantity and Quality of Exercise for Developing and Maintaining Cardiorespiratory, Musculoskeletal, and Neuromotor Fitness in Apparently Healthy Adults: Guidance for Prescribing Exercise. Position Stand. In: Medicine & Science in Sports & Exercise, 1334–1359.
14. Gusy, B., Lohmann, K., Marcus, K. (2012): Sind Bachelor-/Masterstudierende stärker ausgebrannt? Ein Vergleich von Studierenden in „alten" und „neuen"Studienstrukturen. In: Prävention und Gesundheitsförderung 4/2012, 237–245.
15. Jurakić D., Pedišić Ž., Andrijašević M. (2009) Physical activity of Croatian population: cross-sectional study using international physical activity questionnaire. Croat Med J; 50:165-173.
16. Keller, S., Maddock, J. E., Hannöver, W., Thyrian, J. R., Basler, H. (2008): Multiple risk behaviors in German first year university students. In: Preventive Medicine 46/2008, 189–195.
17. Lapa TY. (2015) Physical activity levels and psychological well-being: A case study of University students. Procedia – Social and behavioral Sciences 186, pp. 739-743.
18. Lebedina-Manzoni, M., Lotar, M., Ricijaš, N. (2008). Podložnost vršnjačkom pritisku kod adolescenata izazovi definiranja i mjerenja. *Ljetopis socijalnog rada, 15*(3), 401–419.
19. Markuš, D., Andrijašević, M., Prskalo, I. (2008). Tjelesna aktivnost maturanata, *Odgojne znanosti, 10* (2), 349–367.
20. Mir, E., Lichtenberger, D., Pichler, C., Wegscheider, M. (2012): Schleuderfrei durchs Studium – Entwicklung eines Antistresskurses für berufsbegleitend Studierende im Zuge einer Lehrveranstaltungstrilogie zum Thema Gesundheitsförderung. In: Zeitschrift für Medizinische Psychologie 21/2012, 199–202.
21. Mir, E. (2013): Mittendrin statt nur dabei… Studentische Partizipation im Kontext hochschulischer Gesundheitsförderung. In: Prävention und Gesundheitsförderung 8/2013, 212–217.
22. Mir, E., Gebhard, D., Mitterbacher, A. (2015) Gesunder Start ins Studium – ein Pilotprojekt zur Förderung der Studierendengesundheit, Bewegungsorientierte Gesundheitsförderung an Hochschulen,Hochschulsport:

Bildung und Wissenschaft, Band 3; page 381 – 387, Universitätsverlag Göttingen, http://univerlag.uni-goettingen.de ; ISBN: 978-3-86395-202-0; ISSN: 1864-189X
23. Musselman .JR.B., Rutledge P.C. (2010). The incongruous alcohol-activity association: Physical activity and alcohol consumption in college students. Psychology of Sport and Exercise, 11(6), 609-618.
24. Reed J.A., Phillips D.A. (2005) Relationships between physical activity and the proximity of exercise facilities and home exercise equipment used by undergraduate university students. Journal of American college health, 53(6), 285-290.
25. Miller K., Ruth R., Rayens MK., Noland M. (2005) Levels and charachteristics of physical activity among a college student cohort. American Journal of Health Education, Volume 36, No.4, pp.215-220.
26. Pedišić Ž., Rakovac M., Titze S., Jurakić D., Oja P. (2013) Domainspecific physical activity and health related quality of life in university students, European Journal of sport science, 1-8. doi:10.1080/17461391.2013.844861.
27. Pedišić, Ž. (2014). Measurement Issues And Poor Adjustments For Physical Activity And Sleep Undermine Sedentary Behaviour Research –+ The Focus Should Shift To The Balance Between Sleep, Sedentary Behaviour, Standing And Activity. *Kinesiology, 46* (1), 135-146.
28. Rakovac M., Pedišić Ž., Pranić S., Greblo Z., Hodak D. (2013) Sociodemographic and lifestyle correlates of health related quality of life in Croatian students. Applied research in quality of life, 8(4), 493-509.
29. Sliško, A. (2015) Odnos tjelesne aktivnosti, indeksa tjelesne mase i kvalitete života kod studenata. Diplomski rad, Osijek, Hrvatska.
30. Sparling P.B., Snow T.K. (2002) Physical activity patterns in recent college alumni. Research Quarterly for exercise and sport, 73, 200-205.
31. World Health Organization, (1997). Obesity, preventing and managing of global epidemic. Report of WHO Consultation on Obesity, Geneva, June 3-5, 1997. Geneva/on line/ Retrieved from http://whqlibdoc.who.int/hq/1998/WHO_NUT_NCD_98.1_%28p1-158%29.pd [accessed 07/04/2013].

*Correspondence to:*
*Amra Nožinović Mujanović, PhD*
*University of Tuzla*
*Faculty of Physical Education and Sport*
*2.oktobra br.1, 75000 Tuzla, BiH*
*Phone:+387(0)35 278 535*
*E-mail: amra.nozinovic@untz.ba*