

ASSESSMENT AND ROLE OF PHYSICAL ACTIVITY AS A FACTOR AFFECTING SUBJECTIVE PERCEPTION OF STUDENTS' SATISFACTION

MIROSLAVA BARCALOVÁ¹, ERIKA LIPTÁKOVÁ², SILVIA MRÁZKOVÁ

¹Department of Physical Education, Technical University of Košice

²Department of Applied Mathematics and Business Informatics, Faculty of Economics, Technical University of Košice

ABSTRACT

Key words: physical activity, physical exercise, university students, World Health Organization.

The paper aims to provide analysis of Slovak university students' physical activity during state-ordered distance learning in the academic year 2021/2022 (the COVID-19 pandemic). The data were obtained in form of a questionnaire survey. In the analytical part, the focus is on weekly time that students devoted to regular exercise and quantification of physical activity versus subjective perception of selected physical and psychological satisfaction and health indicators. To meet the paper's objectives, a two-sample t-test was used to test statistical significance of differences between men and women, and parametric and non-parametric correlation analysis methods. In terms of age structure majority of students falls into young adults' category, in which physical activity has only a small positive effect on the subjective perception of satisfaction. Majority of students exercised on average up to 50 minutes per week, which is less than weekly physical activity during regular face-to-face lessons of Physical Education.

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INTRODUCTION

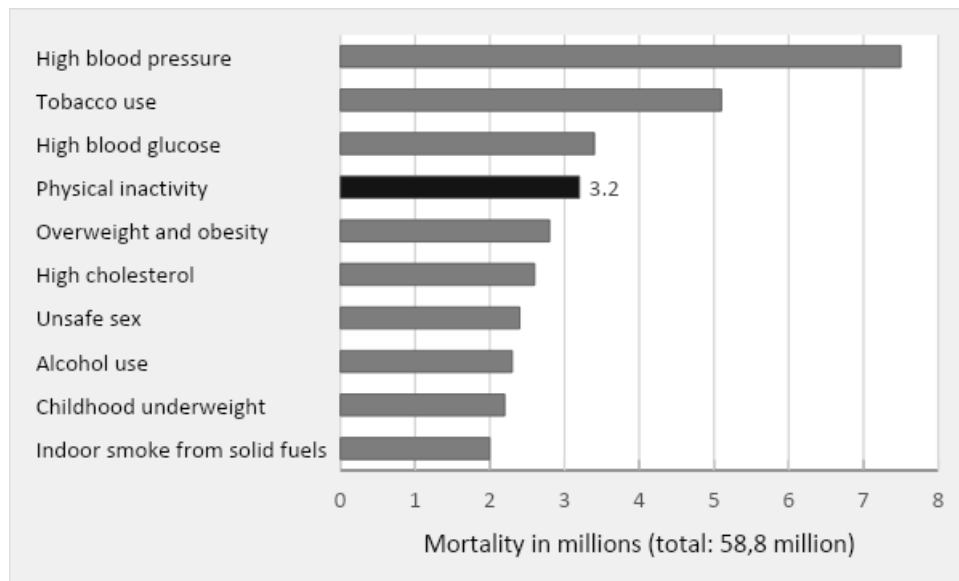
Subjective assessment of health has long been one of variables that dominantly affect the individuals' satisfaction (Palmore and Luikart, 1972). Physical activity is considered an important determinant and

tool for increasing individuals' quality of life and satisfaction. That is why in recent years, increasing attention has been paid to support creation of action plans for sport and physical activity's development (World Health Organization, 2018), and

there is an appeal to include these activities in national strategies of sustainable development (United Nations, 2020). The World Health Organization defines physical activity as *any body movement caused by skeletal muscles, the implementation of which requires expenditure of energy*. In addition to active sports and exercise, the definition also includes any physical activity performed at work, in free time or when moving from place to place (Maragkoudakis, 2017). Recent evidence shows that physical exercise triggers strong neuroplastic phenomena, partially mediated by epigenetic mechanisms (Fernandes et al., 2017), which can be of great benefit to individuals in terms of improving their flexibility and mobility in professional personal growth. Well-chosen physical activity reduces stress and prevents occurrence and development of diseases of civilization. However, technical progress, globalization and the ever-increasing rate

of digitalization have caused movement and physical activity to become an increasingly less necessary part of human life, with sedentary way of life prevailing and a worldwide reduction in physical activity in all age categories.

Based on an analysis of insufficient physical activity global trends between 2001-2016, the World Health Organization speaks of a pandemic of physical inactivity (Guthold et al., 2018; Kohl et al., 2012). The term pandemic represents a condition that affects a large geographical area and occurs on the continents, even worldwide. In recent decades, the pandemic of physical inactivity has contributed to a significant number of chronic diseases and premature deaths. Since 2009, it has been ranked fourth in a list of leading global mortality risks, surpassing even overweight and obesity and alcohol use. The factors that most contribute to an increased death risk are shown in Figure 1 (World Health Organization, 2009).

Figure 1 Ten leading factors causes of death in 2004 by World Health Organization

Source: World Health Organization (2009)

A dependence of physical and mental health has been confirmed by several conducted studies. Regular physical activity reduces risk of depression (World Health Organization, 2014), helps relieve stress and anxiety (United Nations, 2020), reduces the risk of dementia and has an effect on improving cognitive functions (PAGAC, 2018). One of possible explanations for why physical activity causes these positive structural and functional changes in cognitive functions is the stimulation of blood circulation in neural circuits that are involved in cognitive abilities, occurring during any physical activity (Erickson et al., 2012).

Another explanation can be acquisition of cerebral reserves, i.e., mechanisms serving as brain protection - these mechanisms are higher in individuals who, besides higher education and a healthy diet, also maintain regular physical activity (Mandolesi et al., 2017).

The World Health Organization recommends 150 minutes of aerobic physical activity (PA) of moderate to high intensity and a power training at least twice a week for people aged 18-64 years (World Health Organization, 2010). American College of Sports Medicine comes out of the World Health Organization recommendations; however, it recommends 150 minutes of targeted

moderate-intensity exercise lasting 30-60 minutes a day, or 75-minute high-intensity exercise lasting 20-60 minutes a day for children and adolescents (Twisk, 2001).

This paper points out the importance of physical activity as a satisfaction factor and determinant of quality of life among university students. The analytical part is based on a questionnaire survey carried out among students of three Slovak universities in January 2022. The questionnaire was aimed at collecting information on Slovak university students' physical activity during the COVID-19

pandemic, when students could not have a compulsory subject Physical Education as part of face-to-face teaching. Within the analysis, attention is also being paid to a relation between physical activity and subjective student satisfaction assessment. The conclusions are being formulated based on primary data assessment from the questionnaire collection. The partial objectives of the paper are the comparison of physical activity level between the sexes and the assessment of physical activity in the examined sample of respondents.

METHODOLOGY

The analyzed data came from a questionnaire survey carried out by the Department of Physical Education of Technical University of Košice. The questions were focused on the intensity and form of physical activity and subjective perception of satisfaction. The primary data set consisted of 3129 respondents' answers, 1689 men (54%) and 1440 women (46%) answered the questionnaire. The overall average age of the group was 21.6 years (SD = 4.4). The

average age in the male group was 21.3 years (SD = 4) and 22 years (SD = 4.8) in the female group. The questionnaire was distributed to students online, via communication systems of three Slovak universities: Technical University of Košice ($N_1 = 2238$), Matej Bel University ($N_2 = 621$) and Slovak Medical University ($N_3 = 270$). Non-parametric correlation analysis? Spearman's correlation coefficient, was used to examine strength of the relationships between the observed variables.

RESULTS AND DISCUSSION

Based on recommendations of the World Health Organization, the level of physical

activity was monitored in our research. A criterion for meeting recommended requirements was a physical activity

lasting a minimum of 150 minutes per week. Since the questionnaire was collected among students during the COVID-19 pandemic, a reduction in physical activity due to distance learning and limited movement was assumed.

Students thus had an opportunity to prioritize aerobic or anaerobic exercise indoors or outdoors. Table 1 shows an average duration of physical activity performed as an exercise indoors or outdoors.

Table 1 Weekly physical activity (PA)

	Average weekly PA (in minutes)	Frequency of answers
Men	182 min.	1689 (54 %)
< 150 min PA/week	49 min.	980 (58 %)
≥ 150 min PA/week	365 min.	709 (42 %)
Women	111 min.	1439 (46 %)
< 150 min PA/week	48 min.	1050 (73 %)
≥ 150 min PA/week	278 min.	389 (27 %)
TOTAL	149 min.	3128 (100 %)

Source: Own research

Almost 58% of men and 73% of women did not meet a critical limit - 150 minutes/week of physical activity. Both groups performed an average of less than 50 minutes of physical activity per week, which is less than standard exercise time during a physical education lesson (2 x 45 minutes), which students are obliged to have once a week.

Physical activity lasting more than 150 minutes/week was performed by 42% of men. The average length of physical activity per week in that group of men was

365 minutes. Physical activity lasting more than 150 minutes/week was performed by 27% of women. The average length of physical activity per week in that group of women was 278 minutes. A two-sample t-test confirmed a statistically significant difference in the mean value of physical activity between men and women ($p < 0.001$).

Physical activity defined in this way was compared with the results found for people over 15 living in Slovakia in the Eurobarometer survey (2014). As shown in Table 2, in the Eurobarometer (2014)

survey, 35.5% of men and 23.7% of women over 15 living in Slovakia stated that they meet the recommendations set by the World Health Organization (≥ 150

minutes of PA/week). According to our survey results, 6.5% more men and 3.4% more women meet the defined criteria.

Table 2 Comparison of the Eurobarometer survey in Slovak population (2014) with the results of conducted questionnaire survey

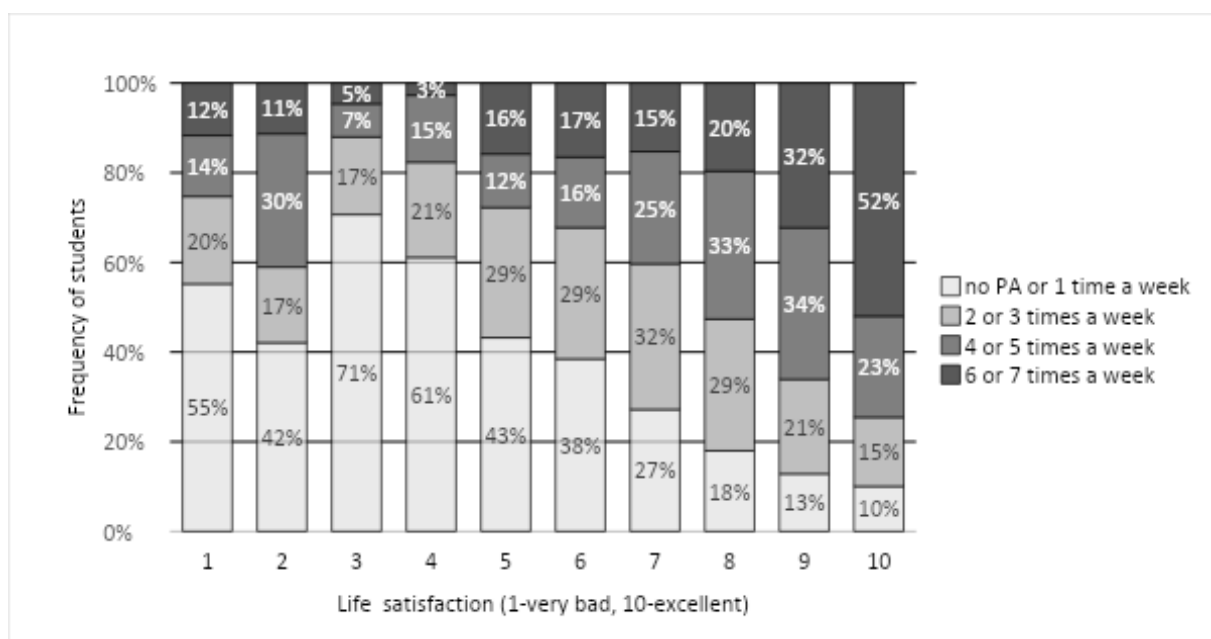
	≥ 150 minutes of PA/week (Eurobarometer, 2014)	≥ 150 minutes PA/week (our survey)
Men	35.5%	42%
Women	23.7%	27%

Source: Eurobarometer survey (2014), own survey (2022)

Figure 2 shows a percentage of students in terms of their subjective assessment of physical and psychological satisfaction depending on a frequency of exercise per week. Students with no physical activity or

very low physical activity (only 1 time per week) dominates with low values of life satisfaction (rating 1-4). Students with a high frequency of physical activity dominate with high values of life satisfaction (rating 8-10).

Figure 2 Relationship between frequency of physical activity per week and subjective perception of physical and psychological satisfaction



Source: Own survey

A correlation analysis was used to examine dependence of the exercise and the subjective assessment of students' physical and psychological satisfaction (Table 3). On a scale from 1 (very bad) to 10 (excellent), the students were to express a subjective assessment of their life satisfaction, physical strength, and coordination skills. Students expressed their level of stress on a scale from 1 (no stress) to 10 (maximum stress). Correlation coefficients (Spearman's) listed in Table 3

are statistically significant at the 10% significance level. There is a positive dependence between life satisfaction, physical strength, and coordination, in relation to exercise frequency. However, since the correlation coefficients are $< |0.5|$, a weaker dependence between all pairs of variables can be assumed. The stress is negatively correlated with all other variables. The highest negative correlation was confirmed between stress and life satisfaction.

Table 3 Correlation matrix (Spearman's rank correlation)

	Frequency of exercise	Life satisfaction	Physical strength	Coordination
Life satisfaction	0.35*			
Physical strength	0.33*	0.42*		
Coordination	0.21*	0.37*	0.47*	
Stress	-0.21*	-0.33*	-0.18*	-0.17*

Note: * indicates statistical significance at 10%.

This paper deals with research into interdependence between the performance of physical activity and the subjective assessment of satisfaction of a selected sample of Slovak university students. Compared to other age groups, young adults generally perceive their

health positively (e.g. Kaleta et al., 2009).

The results comply with the experimental investigation carried out by the team of authors Maher et al. (2015), who pointed out differences in physical activity as a determining factor of satisfaction in individual ages of life. While the dependence between physical and

psychological health was highest in middle age (35-64 years), a significantly lower rate of dependence was recorded in emerging adulthood, 18-25 years.

The highest correlation was present between subjective perception of physical strength and coordination. Core strengthening training and core stability training, which help to ensure proper coordination, represent the basic body's core trainings (Hibbs et al., 2008) and play an important role in specialized sports training (comparison of Jesenský and Kokinda, 2017), which a part of interviewed students is demonstrably devoted to. Out of the two variables, the data indicate a greater dependence of subjective perception of physical strength in relation to frequency of exercise. We can assume that students are only slightly aware of the importance of simultaneous involvement of both these elements in an exercise activity. That is why, personal contact or contactless interaction (trainer versus trainee) plays an important role in the exercise. Specific conditions of the Covid-19 pandemic have limited regular personal interaction between teachers and students even at this level, which in some cases could lead to a decreased quality of individual physical activity, thus a smaller

subjective perception of improvement in physical and psychological satisfaction and health.

CONCLUSIONS

Based on the conducted survey, a regular physical activity can be concluded as one of factors that positively affect the overall respondents' satisfaction and their feeling of well-being. Physical activity and exercise have positive biological and psychological effects that affect the brain and its cognitive functioning. Majority of respondents devoted less time to exercise per week than they would have devoted to a compulsory physical education lesson within their full-time studies. Although studies, in general, show a significant positive relationship between physical activity and respondents' satisfaction, in our survey, physical activity plays only a partial role in the subjective perception of satisfaction of young adults. There is a dependency between subjective perception of physical strength and coordination, which should form a part of every professionally prepared exercise unit. Neglecting one of these elements can lead to a lower physical activity's effect on the overall satisfaction of students. That is why, it was important to use all available forms of personal interaction between physical education teachers and students during the distance learning within which the questionnaire survey had been carried out.

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