

Level of physical activity of students from the police force academy in Bratislava

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Abstract

Background and Study Aim A healthy and active lifestyle is becoming one of the most talked topics amongst people from all over the world. Being more physically active has never been more important than today as both jobs and leisure activities are becoming increasingly sedentary. Humans have moved from being very physically active to being less and less active each year. The aim of our study was to find out the degree of satisfaction and the frequency of performing leisure activities among students of the Police Academy in Bratislava, Slovakia.

Material and Methods For the purpose of our study, we have used a short version of International Physical Activity Questionnaire (IPAQ) that consisted of 7 questions. The survey was attended by 439 students of the Police Academy located in Bratislava, capital of Slovakia. Our study group was divided into two groups according to their gender, the first group consisted of 249 female students and the second of 190 male students. The overall average age of our students of 21.55 years. Our survey was carried out at the end of the summer semester in June 2022. Questionnaire was carried out online and created through Google forms. The results of the questionnaire were later compared based on the participants gender and analysed using homogeneity test of two independent samples, two-sample t-test with equality and inequality of variances and the chi-square test at the level of significance $p < 0.01$ or $p < 0.05$.

Results When compared, male students in general were more active than female students - median of 30 minutes a week. Male students engaged in vigorous intensity physical activity on average more than 15 minutes a week compared to female students. Moderate intensity physical activity difference was even bigger (23,09 minutes a week) in favour of male students, these results have proven to be also statistically significant at the level of significance $p < 0.01$. Female participants of our study were slightly more active in walking physical activity, 2.92 minutes a week on average, but the difference between our two studied groups have not proven to be statistically significant at the level of significance $p < 0.05$.

Conclusions Here in our study, we've looked at physical activity, physical activity levels and how much students attending Academy of the Police Force in Bratislava engage in them. By comparing our survey participants to adults from other countries we can conclude that both our male and female participants have shown higher physical activity levels.

Keywords: IPAQ, university students, physical activity, healthy lifestyle

Introduction

The physical, economic, and social environments have undergone rapid change in the last century, where our society has switched from being very physically active to being less and less active every year [1]. It has been determined by Centers for Disease Control and Prevention that in 2020 among adults aged over 18 that only 24.2% met the recommended guidelines for both aerobic and muscle-strengthening activities and more than three-quarters (81%) of adolescents didn't meet

these recommendations [2]. In 2018, the World Health Assembly came with a plan called Global Action Plan on Physical Activity 2018-2030 that aims to reduce global levels of physical inactivity in adults and adolescents by 15% by 2030 [3]. There are various factors affecting leisure time activities and whether people spend them being active or not such as sex, age, smoking status, level of educational attainment, income etc. [4]. One of recent events – spread of Covid-19 has also negatively impacted average engagement in physical activities in all age groups, where a lot of countries have isolated their citizens to their homes restricting them to go out [5]. According to several studies higher level of

education and higher income are factors associated with higher participation in physical activities in various age groups. Despite all this knowledge, physical activity levels in most developed countries remain low, with women having consistently lower rates of engagement in them [6].

Regular physical activity is associated with improvement of not only physical, but also mental health and steep reduction of many chronic diseases and premature all-cause mortality [7]. Both sedentary lifestyle and physical inactivity were linked to higher risk of premature mortality, especially when they occur together [7]. Nowadays it is very common for humans to spend hours daily participating in sedentary activities such as watching TV, using computer and electronic games, or sitting in automobiles – all resulting in low levels of metabolic energy expenditure [8]. Currently it is recommended for adults to engage in at least 150–300 minutes per week of moderate-intensity, 75–150 minutes per week of vigorous-intensity of aerobic physical activity or its equivalent of moderate and vigorous-intensity physical activity [9]. On the top of these aerobic physical activities, it is recommended to strengthen all major muscle groups for 2 or more days per week [10]. It has been proven that physical activity successfully lowers the risk of depression, reduces symptoms of anxiety regardless on whether the episode is acute or chronic and improves sleep quality – reduced awakening, increased deep sleep and reduced daytime sleepiness [9].

Aim. The aim of the survey was to determine the degree of satisfaction and the frequency of performing leisure activities among students of the Academy of The Police Force in Bratislava, Slovakia.

Material and Methods

Participants

The survey was attended by 439 bachelor's and master's degrees students of the Academy of Police in Bratislava of the study programs Security-law protection of persons and property and Security-law services in public administration. The Academy is unique in Slovakia - it prepares university-qualified and professionally competent experts for the units of the Police Force, special workplaces of the Ministry of the Interior affairs of the Slovak Republic and other state and non-state security services. Out of those 439 students, there were 249 women with an average age of 21.26 and 190 men with an average age of 21.93 years. The overall average age of the examined sample was 21.55 years. All procedure performed in this study were in accordance with ethical standard of the institutional Research Ethics Committee. Informed consent was obtained from all participants involved in this study.

Research Design

We carried out the survey after the end of the

summer semester in June 2022 in the form of an electronic questionnaire created through Google forms. We analysed the results from the aspect of intersex differences (men/women) using the homogeneity test of two independent samples (F test), two-sample t-test with equality and inequality of variances, but also using the chi-square test at the level of significance $p < 0.01$ or $p < 0.05$.

Data obtained from questionnaire were converted to Metabolic Equivalent of Task units (MET-minutes/week). MET-minutes/week was calculated by multiplying the number of exercising minutes per day by the number of exercises per week by the MET coefficient of physical activity intensity (vigorous PA = 8 MET, moderate PA = 4 MET and walking PA = 3.3 MET). The MET coefficient of exercise intensity resembles person's oxygen consumption during physical activity corresponding to oxygen consumption at rest. Survey participants were then classified into three different groups based on the following criteria:

1. High physical activity – three or more days of vigorous physical exercise, including at least 1,500 MET-minutes/week, or seven or more days of any combination of vigorous exercise, moderate exercise, and walking that exceeded 3,000 MET-minutes/week.
2. Moderate physical activity – three or more days of vigorous physical exercise (at least 20 minutes per day), or five or more days of moderate exercise or walking (at least 30 minutes per day), or five or more days of a combination of vigorous exercise, moderate exercise, and walking that exceeded 600 MET-minutes/week
3. Low physical activity – Little physical activity that resulted in a failure to comply with the conditions of moderate or high physical activity classifications (less than 600 MET-minutes/week)

Statistical Analysis

We have used a Microsoft Excel spreadsheet by Hoi Lun (Helen) Cheng [11] that enabled us easier and automatic scoring of the IPAQ short form. The following statistical measures and percentages were determined. Homogeneity test of two independent samples (F test): this test was conducted to assess whether the variances of the two groups (men and women) were equal. Chi-square test (χ^2) was conducted to compare the physical activity levels between male and female students. Mean, median, and statistical significance were calculated for physical activity levels with vigorous intensity, including MET-minutes/week, average time per minute, and average days per week. Mean and median were determined for time spent sitting in minutes per week. Percentages were utilized to analyze the proportion of male and female participants engaged in high physical activity.

Results

In the first part of our results, we compare physical activity levels of our participants based on their gender. As seen in Figure 1, 86.36% of male participants of our survey are considered to engage in high physical activity compared to 75.11% of female participants. Difference in engagement in moderate physical activity between our students was in favour of women (16.29%), when compared to 12.34% of male participants. According to the students' answers, we have created one last group of low-level physical activity, which consisted of only 1.30% of male participants and 8.60% of female participants.

Table 1 interprets vigorous intensity physical activity levels of the police academy students divided into groups according to their sex. Looking at the results of MET we can conclude that male

participants engaged in vigorous intensity physical activities 33% more than their female counterparts. Male students spend average of 95.92 minutes a week engaging in vigorous intensity physical activity levels compared to 80.61 minutes a week of female students. Looking at the number of days a week spent engaging in these level activities, male students spent almost a day a week more than the female students (3.08). From the statistical point of view, when comparing the results of male and female students, all our results came back as statistically significant at the level of significance $p < 0.01$.

Table 2 interprets moderate intensity physical activity. Same as in previous table our male participants were more active than their female counterparts. Moderate intensity physical activity MET-minutes/week for male students was 720 and for female it was 480 with proven statistical significance at the level of significance $p < 0.01$

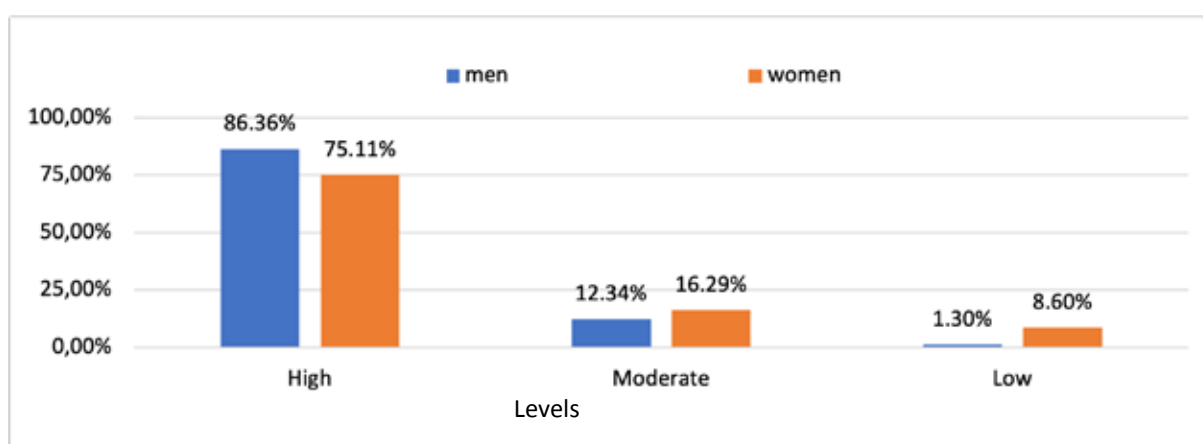


Figure 1. Comparison of physical activity levels between male and female students ($\chi^2_{(2)} = 11.04^{**}$; $p = 0.004$)

Table 1. Physical activity levels with vigorous intensity interpreted in MET-minutes/week, days per week, minutes a week and its statistical significance

Vigorous intensity	Male students	Female students	Statistical significance
MET-minutes/week	2880	1920	1.10E-05**
Average of time/min	95.92	80.61	0.0009**
Median of time/min	90	90	
Average of days/week	3.86	3.08	7.37E-05**

Note: ** - $p < 0.01$

Table 2. Physical activity levels with moderate intensity interpreted in MET-minutes/week, days per week, minutes a week and its statistical significance

Moderate intensity	Male students	Female students	Statistical significance
MET-minutes/week	720	480	1.55E-05**
Average of time/min	80.86	57.77	1.67E-05**
Median of time/min	60	60	
Average of days/week	2.85	2.41	0.024*

Note: ** - $p < 0.01$

Table 3. Walking time of students interpreted in MET-minutes/week, days per week, minutes a week and its statistical significance

Walking	Male students	Female students	Statistical significance
MET-minutes/week	924	792	0.299
Average of time/min	73	75.92	0.620
Median of time/min	60	60	
Average of days/week	5.33	5.26	0.728

Table 4. Time spent sitting in minutes per week

Time spent sitting	Male students	Female students	Statistical significance
Mean	244.72	211.57	0.895
Median	240	210	

(1.55E-05). In one week, our male students average 80.86 minutes of moderate intensity physical activity, female students averaged 23.09 minutes less which resulted in statistically significant differences at the level of significance $p < 0.01$ (1.67E-05). Looking at the very bottom of our table we find average of days a week spent engaging in moderate intensity physical activity from which we conclude that our male participants spent more time/ days a week participating in these activities and the differences between them, and their female counterparts were significant at the level of significance $p < 0.05$ (0.0024).

Table 3 regarded walking intensity level of physical activity. By looking at the table 3, we can see that the difference between time spent walking amongst our two group of male and female participants was only 2.92 minutes a week, which has been proven to not be statistically significant at the level of significance $p < 0.05$ (0.620). The only slightly bigger difference we can see is the difference in MET-minutes/week, which for male students was 924 and female students was 792, but again these results when compared were proven to not be statistically significant at the level of significance $p < 0.05$ (0.299). As the average of days a week spent walking shows, walking intensity level of physical activity was the most popular one when compared to vigorous and moderate intensity level of physical activity.

Looking at average time spent sitting we see more than half an hour difference between our two questioned groups, where our male students sit more. When compared, differences between these results have not been proven to be statistically significant at the level of significance $p < 0.05$ (0.895).

Discussion

Physical activity has been clearly proven to be beneficial for both physical and mental health. Recent studies have shown increasingly higher

chances of mortality, chronic diseases and even cancer in people, who are physically inactive [12]. Sedentary professions in the United States have increased by 20% from 1960 to 2008 with a graduate decline of more active professions. Studies have also shown that during workdays French people spend approximately 10 hours a day sitting and almost 8 hours a day sitting on non – workdays [13]. Not only are we facing diseases such as diabetes, obesity or cancer, but in the 2019, a global pandemic hit and still is threatening even though the world's conditions have begun to gradually recover [14].

World Health Organization recommends every adult aged 18-64 to regularly engage in 150-300 minutes of moderate intensity physical activity or 75-150 minutes of vigorous intensity physical activity during the week or its combination [10]. World Health Organization also recommends to train and exercise the largest muscle groups at least twice a week [10].

The level of physical activity with vigorous intensity of our male participants was 2880 MET-minutes/week, which is higher than university students from Turkey (1880), but lower than university students from Poland (3178) as reported by Bednarek et al. [15]. As data show, female students from University of Tuzla have engaged in physical activities with vigorous intensity on average 411 MET-minutes/week compared to our female participants at 1920 MET-minutes/week [16].

Pastuzsak et al. [17] have shown an insight look at physical activities of university students of physical education from Poland and students from Charles University in Prague. Moderate intensity of physical activity of male students from Charles University was 1398 MET-minutes/week, for PE students it was 1152 MET-minutes/week and for our students it was significantly lower at 720 MET-minutes/week. Female participants from our study have also engaged in moderate level physical activities less than their counterparts from Poland and Prague. Our female students scored and average of 480

MET-minutes/week, PE students scored 526 MET-minutes/week and students from Prague have again engaged in moderate intensity physical activities significantly more at 1862 MET-minutes/week [17].

Morreno-Llamas [18] studied 1653 participants from European Union aged 15-24. It was found out that their average weekly walking time was considerably higher - 220 minutes, compared to 73 minutes of our male participants and 75.92 minutes of our female participants. They have also reported that their participants would walk 5 days a week, same as ours.

Bennie et al. [19] reported about the results of time spent sitting by European adults aged 15-98 from 32 different European countries. Average of time spent sitting a week for European adults is 300 minutes, our students spend reportedly much less, male students around 240 minutes and female students around 210 minutes per week [20]. Usual sitting time for Europe's adult population was 309 minutes/day. When we look at our results, we can see that both our male (240) and female (210) participants have spent significantly less time sitting than what an average of Europe's adult population is. On the other hand, Eurobarometer indicates that adults in Europe spend 5-6 hours a day sitting on average.

Strengths of this study include an inside look at previously not studied group of students from the Police Force Academy in Bratislava, results comparison with various studies across the world and use of an internationally accepted questionnaire that can be easily compared and reviewed by other scholars. On the other hand, there are certain limitations of this study as the number of participants and their relatively limited age range.

Conclusions

Here in our study, we've looked at physical activity, physical activity levels and how much students attending Academy of the Police Force in Bratislava engage in them. By comparing our survey participants to adults from other countries we can conclude that both our male and female participants have shown higher physical activity levels. In our study we also look at sedentary behaviour and conversion of worlds society towards more sedentary jobs and lifestyle, one of our survey questions regarded time spent sitting during the week.

Our survey was administrated using International Physical Activities Questionnaire (IPAQ) that consisted of 7 questions regarding physical activities. IPAQ is considered to have acceptable validity when assessing levels and patterns of physical activity in healthy adults [21]. When scoring the results of the answers of the study participants, we have used a Microsoft Excel spreadsheet developed by Hoi Lun (Helen) Cheng [11] that helped us to automatize and speed up the scoring process.

86.36% of male participants and 75.11% of female participants reported to have High physical activity, which is considerably higher than prevalence of high physical activity around the world which is reported to be 21 – 63% [22]. The prevalence of low physical activity among more than 52000 adults from 20 different countries ranged from 7–41% among males, and 6–49% among females compared to our 1.3% of males and 8.6% of females [22].

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