

The Perception of Physical Activity / Physical Education Among University Employees

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Abstract: *Questionnaires are an effective way to assess the level of physical activity. The aim of our study was to assess subjectively the physical activity of university employees by using a self-report scale. The online self-report questionnaire used in our study was applied anonymously in October 2021 and was completed by 126 respondents. To analyze the results, we used analysis of variance and Bonferroni post hoc test for the groups (gender, occupation, area of residence, level of study, and age) included in our research. The analysis by gender revealed that females were more active than males. Participants from rural areas were the most active group in our study compared to those from urban areas, who recorded one of the smallest values. Statistical significance was achieved in all analyses. This study assessed the level of physical activity among university employees, and the results of our analysis showed that over 78% of the participants met the requirements of moderate to high-level physical activity according to the guidelines. Our results and data analysis suggest that the perception of physical activity / physical education in the daily life of university employees is high, but professional activity and leisure time prevail in their schedule.*

Keywords: *adults; physical exercise; profession; questionnaire.*

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1. Introduction

The general recommendation for the level of physical activity (PA) is to practice different kinds of PAs for at least 150 minutes per week, World Health Organization (2020); World Health Organization (2022). However, the COVID-19 pandemic has reduced the weekly time for PAs and, in many cases, the interruption of such activities, Tomaz et al. (2022). This trend of less daily PA imposed by the pandemic means sedentary behavior for individuals, who are unfortunately exposed to the risks associated with this behavior (Constandt et al., 2020). Moreover, because of the confinement, some individuals experienced depressive symptoms, stress, anxiety, issues concerning mental health, and disturbances in sleep quality, Garcia-Garro et al. (2022), all of which affect the quality of life.

Questionnaires are an effective way to assess the level of PA because they are usually short, easy to understand, and easy to apply to a group, (Karolinska Institute, 2005; Leuciuc et al., 2020). Thus, they are mainly used for the self-report method. At present, the general trend of PA among adults indicates a decrease in their PA and physical fitness, with women usually less active than men (Clark et al., 2022). Health-related quality of life (HRQoL), (Yin et al., 2016) was influenced by the pandemic context. University teachers with a low HRQoL experienced depression, stress, neck disability, and weight change during this difficult period compared to those with high HRQoL, whose benefits included high satisfaction with online teaching, health self-evaluation, and work load change (Almhdawi et al., 2021). Many studies indicated that along with a decreasing trend of PAs among adults, there was an increasing trend concerning sitting time, as assessed using the International Physical Activity Questionnaire (IPAQ). This suggested that the sedentary behavior of the adults will generate in time certain diseases associated with this lifestyle (Al Zahib & Baarimah, 2020; Castaneda-Babarro et al. 2020), given that a sedentary one is associated with health issues.

In many situations, the professional activity of university employees (teachers and administrative personnel) is considered an easy one in terms of PA because they usually carry out daily office work with a lot of sitting time and limited PA (Almhdawi et al., 2021). An association between the level of PA and sickness absenteeism was identified, making it necessary to identify some strategies to increase the level of PA among university employees and reduce days off work due to illness (Lopez-Bueno et al., 2020). According to the Work Law (no. 53/2003, article 112, line 1) in Romania, Ministerul Muncii (2003), a working day entails eight hours of professional activities, and this rule is applied to university employees.

The 2022 global status report of the World Health Organization (WHO) set a goal to reduce the global level of physical inactivity (which is defined "as doing insufficient physical activity to meet current physical activity recommendations") by 15% until 2030. This is a bold goal that requires great involvement and commitment from policy-makers, governments, civil society, sport and exercise organizations, academic and educational institutions, the public health sector, and the general population in order to make them aware of the benefits of PA for every individual and the society, World Health Organization (2022). In the current situation where one out of four persons is inactive, the aim is to reduce this proportion to one out of five persons or from around 25% to 20% in the next seven years. A disturbing situation is found regarding the youth, the future adults, where over 80% are insufficiently physically active. The data were obtained from a large study that included over 1,6 million participants from 146 countries and territories, covering a period of 16 years. A total of 27 countries—usually low-income countries where the level of general education of the population is poor—recorded over 90% of the youth population as insufficiently physically active, an aspect that influences health status and life quality (Guthold et al., 2020). The health risks associated with a low level of PA affect the daily activities of individuals. Of the five leading factors identified as contributing to global burden diseases, namely, high systolic blood pressure, smoking, high fasting plasma glucose, high body-mass index, and short gestation for birth weight, at least four are associated with a sedentary lifestyle and the lack of daily Pas, Stanaway et al. (2018). For middle-age adults, an association was found between body mass index (BMI) and various health outcomes. Regular PAs are recommended to maintain an optimal level of BMI (between 18.5 and 25 points); PAs with moderate and vigorous intensity are especially useful to slow the decline of BMI with increasing age (Cleven et al., 2023). A moderate association was observed for those adults with a good level of daily PA and the positive influence of this on their BMI, body image, and quality of life being (Milanović et al., 2022).

The aim of our study is to assess subjectively the PA of the participants by using a self-report scale.

1.1. Methodology

Participants

All potential respondents (i.e., university employees at Stefan cel Mare University of Suceava), were invited to participate through an institutional email in October 2021. They were given one month to submit

their answers. During this period, 126 participants submitted their responses to our questionnaire regarding PA.

Owing to the small number of participants by age distribution under 30 years old and over 60 years old, we used only three categories by age distribution in our analysis: under 40 years old, 41–50 years old, and over 50 years old. By using only three age groups for analysis, we ensured that the numbers of participants in each group were almost similar, specifically under 40 years old (n=42), 41–50 years old (n=45) and, over 50 years old (n=39), which was more relevant for our statistical analysis.

Physical activity questionnaire

We used the IPAQ-Short Form (IPAQ-SF) in our study. It was applied anonymously, online; university employees received a link to fill in specific information concerning their personal data, including age, study level, area of residence, type of work, and PA. The participants agreed that the data could be used only for scientific purposes according to the General Data Protection Regulation rules (679/2016). The questionnaire was applied in October 2021. Our study used the Romanian version of the IPAQ. This version is a valid one because it is used and mentioned in nine previous studies according to the Web of Science.

We followed IPAQ guidelines to assess individually collected data for each of the four items. The level of PA was determined by the sum of all items: vigorous activity, moderate activity, and walking. The scoring protocol to determine the level of PA was as follows: low – less than 600 METs per week, moderate – between 600 and 3000 METs per week, and high – more than 3000 METs per week, Karolinska Institute (2005); Ainsworth et al. (2011). Data on daily sitting time of the participants involved in our study were likewise collected.

Statistical analysis

In our study, we first used descriptive statistics (mean, standard deviation), analysis of variance (ANOVA) and Bonferroni post-hoc test (where statistical significance was set at $p=0.05$) for data analysis. We then used the IBM SPSS Statistics 26 program to analyze the collected data. The data were analyzed as follows: by gender (female–male), by occupation (teaching staff–administrative staff), by area of residence (urban–rural), by level of study (PhD–undergraduate, PhD–graduate, graduate–undergraduate), and by age (under 40 years–41 to 50 years, under 40 years–over 50 years, 41 to 50 years–over 50 years).

2. Results

The distribution of the participants by gender, occupation, area of residence, study, and age is presented in Table 1.

Table 1. Data of the participants involved in our study

Gender	Type of work			Level of study	
	Teaching	Administration	PhD	Graduate	Undergraduate
Female (n=78)	49	29	46	25	7
Male (n=48)	40	8	36	10	2

Gender	Age distribution			Residence	
	Under 40	41–50	Over 50	Urban	Rural
Female (n=78)	29	26	23	103	23
Male (n=48)	13	19	16		

The authors created the table, according to the data collected in our study and statistics used to analyze data.

By gender, females accounted for 63% of all university employees while males represented 37%. For the teaching staff, the proportion was equal (50%), but for the administrative staff, the proportion was 75% females and 25% males.

The results obtained from the participants are presented in Table 2.

Table 2. Statistical analysis for groups included in our study.

Groups	X ± SD (MET-min per week)	Significance	Δ
Males vs. Females	2341.72 ± 2318.99 2500.39 ± 2750.41	0.001*	158.67
Teaching vs. Administration	2369.53 ± 2511.05 2603.01 ± 2780.10	0.001*	233.48
Urban vs. Rural	2341.82 ± 2529.91 2879.40 ± 2846.24	0.028*	537.48
PhDs vs. Graduates	2252.27 ± 2461.56 2794.30 ± 2751.06	0.001*	542.03
PhDs vs. Undergraduates	2252.27 ± 2461.56 2771.83 ± 3154.12	0.001*	519.56
Graduates vs. Undergraduates	2794.30 ± 2751.06 2771.83 ± 3154.12	0.001*	22.47
Under 40 years vs. 41–50 years	2311.03 ± 2159.76 2405.41 ± 2971.38	0.001*	94.38

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Under 40 years vs. Over 50 years	2311.03 ± 2159.76 2618.63 ± 2586.72	0.021*	307.60
41–50 years vs. Over 50 years	2405.41 ± 2971.38 2618.63 ± 2586.72	0.025*	213.22

The authors created the table, according to the data collected in our study and statistics used to analyze data.

* significance for level 0.05, X – mean, SD – standard deviation, MET – metabolic equivalent; Δ - overall change in a value between groups

The administrative staff practiced more PAs than did the teachers, and the difference between groups was statistically significant. Residents from rural areas were the most active group in our study compared to those from urban areas, who recorded one of the smallest values. According to the study level, graduates were the most active, followed closely by undergraduates and then by PhDs. There were statistically significant differences between those three groups ($p=0.001$ for PhDs vs. graduates, PhDs vs. undergraduates, and graduates vs. undergraduates). The analysis by group age revealed that the over 50 years old group was the most active, followed by the 41–50 years old group (with a difference of over 200 METs), and finally by the under 40 years old group, who recorded the lowest value. Statistical significance was obtained for all the groups analyzed in our study (by gender, occupation, area of residence, study level and age).

The participants involved in our study showed an average mean of 2559.27 METs, a value associated with a moderate PA level, but individual values were widely spread from 198 METs to 11973 METs. At a low level (less than 600 METs per week) were 28 participants (3 reported no PA during the last week), 64 had a moderate level of PA (between 600 and 3000 METs per week), and 34 reached a high level (over 3000 METs per week). Concerning the categories of PAs practiced by participants, 41 of them preferred vigorous activities, 36 preferred moderate ones, 46 go walking as their main PA, and 3 did not practice any kind of PA. Two-thirds of our participants preferred low and moderate PAs, and for 35%, walking is the main exercise used during their leisure activities. The base concern is that 31 respondents had a low level of PA or sedentary behavior. The interesting fact was that females were more active than males; a difference of almost 160 METs per week was recorded between them. It is important to mention that the questionnaire was applied in October 2021, a pandemic period with some restrictions in Romania. According to the scoring protocol week, Karolinska Institute (2005), the level of PA for our participants was as

follow: 22% - low level, 51% - moderate level and 27% with high level of PA. Those with a high level of PA, over 3000 MET's per week, had additional benefits for health, a better HRQoL, and well-being. A moderate to high level of PA was reported by 78% of the participants included in our study.

The distribution by groups and overall, by sitting/sedentary time of the participants involved in our study is presented in Table 3.

Table 3. Distribution of sedentary time.

Groups	X ± SD (hours per day)	Significance	Δ
Overall (n=126)	6.99 ± 3.04		
Males (n=48)	6.79 ± 3.05	0.991	0.32
Females (n=78)	7.11 ± 3.02		
Teaching (n=88)	6.67 ± 3.00	0.927	1.07
Administration (n=38)	7.74 ± 2.91		
Urban (n=103)	6.94 ± 3.07	0.546	0.26
Rural (n=23)	7.20 ± 2.75		
PhDs (n=82)	6.92 ± 3.15	0.076	0.04
Graduates (n=35)	6.96 ± 2.62	0.774	0.86
Undergraduates (n=9)	7.78 ± 3.23	0.378	0.82
Under 40 years (n=42)	6.70 ± 3.45	0.114	0.78
41–50 years (n=45)	7.48 ± 2.52	0.029*	0.03
Over 50 years (n=39)	6.73 ± 3.01	0.049*	0.75

The authors created the table, according to the data collected in our study and statistics used to analyze data.

* significance for level 0.05

Overall, the participants involved in our study have a sedentary time of 6.99 hours per day, but there were some differences between the analyzed groups (not significant statistically in 7 out of 9 situations). There was a difference of 0.32 hours per day between males and females, with females sitting more than males. The highest difference was recorded by job type; teachers spent less time sitting than the administrative staff. People from rural areas sit 0.25 hours more than people from urban areas. According to the study, PhDs and graduates sat less than 7 hours compared to undergraduates who spent almost 8 hours sitting daily. The distribution of sitting time by age showed that people under 40 years old and over 50 years

old sat less than the 41–50-year-olds who spent 0.75 hours more sitting. With two exceptions (by age distribution), there were no recorded differences that were statistically significant for $p=0.05$ in the rest of the intergroup analysis.

3. Limits and discussions

The aim of our study was to use a self-report scale to assess subjectively the PA of the participants. The general results reported by the participants indicated a good level of PA among university employees. Previous studies mentioned the importance of daily PAs in adults and its benefits for emotional, psychological, and social well-being as well as health status (Aegerter et al., 2022; Kekalainen et al. 2020; Panza et al., 2019).

The analysis by gender revealed that females had a better level of PA than did males, registering a difference of 6.36% and a statistically significant difference between groups, with more than 75% of the participants meeting the minimal requirements for weekly PA (Lesser et al., 2020; Vicente-Herrero et al., 2022). Meanwhile, some previous studies showed that males are usually more active than females (Al Zahib et al., 2020; World Health Organization, 2020; Vicente-Herrero et al., 2022), and there was a general perception that males are more involved than females in PA. As females are more predisposed to osteopenia/osteoporosis, it is recommended, especially for those over 50 years old, to practice daily physical exercises with moderate to vigorous intensity (at least 150 minutes per week), including strength exercises to maintain bone density (Holubiak et al., 2022; Ogonowska-Slodownik et al., 2022; Wallbank et al., 2022). Moderate and vigorous intensity PAs in adults and older adults are essential for mental health, reducing the symptoms of depression (Carvalho et al., 2021). This effect could be a strong argument because the participants over 50 years old included in this study were more active than the other age groups, encountering numerous benefits, which in turn highly motivate them to practice daily physical exercises.

Living in an urban area limited the ability of the residents to engage in different kinds of PAs compared to those from rural areas; this factor also increased their risk of developing sedentary behavior, obesity, and body fat, which will affect their health status and ability to be effective in their daily activities (Vicente-Herrero et al., 2022). Concerning the residence area for adults, those from rural areas reported a higher probability of practicing PA, but a positive association between environment and leisure activity was found for those from urban areas (Cleland et al., 2015). These results were in the same lines as in our study.

The administrative employees carried out office work; in Romania, a working day entails eight hours of professional activities. This aspect also shows that the administrative staff is more active than the teaching staff in their free time (Yassimear et al., 2022). The PhD participants are usually teachers, and they interact with students and technology (computer, electronic platforms, software, database, etc.) in their daily activity. This could be a reason for their low level of PA, which is a potential risk for their health in the future (Moreira et al., 2022). The over 50 years old group was more aware about the importance and benefits of daily PAs, which can be observed in their health status (BMI, adiposity) and physical fitness (endurance, strength, flexibility) (Shozi et al., 2022).

A study conducted by Panciera-di-Zoppola et al. (2021) showed similar results as in our study, where around 78% of the adult participants met the PA targets for moderate and high level. Usually, people who practice moderate to vigorous intensity exercises have normal values for BMI, Churilla (2018) between 18.5 and 25, and this fact could be an important factor for practicing daily PAs according to personal beliefs (Erniquez-Del Castillo et al., 2021), which are a strong motivation to be physically active. Some action plans are necessary for those who did not meet at least the moderate level in order to convince them about the benefits of regular PA and present to them the risks associated with a sedentary lifestyle (e.g., the diseases associated with this, morbidity, and premature mortality) (Ding et al., 2016) in order to make a change in their daily routine and become more active. A study conducted by dos Santos Ferreira Viero et al. (2022) that involved over 2000 persons stated that one out of four adults were physically inactive. A slightly higher rate of physical inactivity (27.5%) was mentioned by Guthold et al. (2018) in a study that collected data concerning the PA of different populations over a 16-year period (2001–2016) before the pandemic for almost 2 million participants.

Following a comprehensive work (systematic literature review, development and use of quality criteria, synthesis of content), Füzéki and colleagues made recommendations for the PA of the German adult population in the same line as those of the WHO (2020); in particular, they should carry out at least 150 minutes of moderate intensity or 75 minutes of vigorous / high-intensity exercises weekly. Additional health benefits were recorded for more than 150 minutes of weekly PA, as well as meaningful health gain for less than 150 minutes of PA per week. The PA program of adults must include aerobic exercises, strength development exercises, and balance exercises in order to keep an optimal level of BMI and a good level of physical fitness. Furthermore, they must reduce their sitting time and

alternate it with some PA (Füzéki et al., 2017). A study conducted by Monteiro et al. (2023) showed that an active lifestyle that includes moderate and vigorous PA for adults and older adults has benefits for physical and mental health, well-being, and good sleep quality. Owing to these multiple positive effects, this kind of activity must be encouraged during the leisure time of adults and the general population.

The COVID-19 pandemic-imposed restrictions that limited people's access to sport facilities. These restrictions influenced the population's behavior toward PA, a fact assessed by the questionnaire (vigorous and moderate effort, walking) and registered as a decreasing trend. Given this context, people spent more time sitting, thus increasing their sedentary behavior, Al-Abdi et al. (2022). Owing to their professional activity, our participants spent around 7 hours daily sitting, and not all of them (23%) compensated for this situation with exercises in their free time. The situation of sitting 7 hours (minimum – 6.70 hours, maximum – 7.78 hours) a day requires some breaks, such as practicing simple and adapted exercises at the office for arms, legs, trunk, and neck in order to prevent the emergence of certain health issues associated with office activity (especially at the spine level, e.g., lordosis, kyphosis, scoliosis). These results concerning sitting / sedentary time could be considered contradictory with the general result, where 78% of the participants were active in their opinion. A plausible explanation is the type of professional activity; usually the university employees had a desk/office job that meant a lot of sitting time during their daily activities, which total 8 hours (Ministerul Muncii, 2003).

Concerning the perception of PA among university employees, we can state that it is high. They practiced different kinds of sport activities during their leisure time, but many of them allocated only between half an hour and one hour per day. It is important to find ways to create sport facilities in universities that can be used by employees in order to improve their physical fitness with both personal and professional benefits, which could increase the efficiency of their professional activity (Urresta et al., 2022). The data in our study were collected through a grant, and our project team prepared a detailed guide of exercises that can be used at the office, at home, outdoors, and in sport facilities. This guide was distributed free of charge for all the university employees.

Our study had a few limitations. The use of questionnaires to determine the level of PA for a certain category of population is beneficial, but we must keep in mind that questionnaires involve a degree of subjectivity, especially when questions refer to personal aspects of daily life. It is important that all people know the benefits of PA in order to create a

strong and sustainable motivation to practice PA daily for a healthy lifestyle and a very good quality of life. Despite the good results, awareness programs regarding the importance of daily PA are necessary in order for university personnel to remain healthy and active. Another limitation is that, in individual self-reports, participants tend to overestimate their potential because of the high degree of subjectivity. Thus, we recommend the use of specific tests or gadgets/applications to assess physical fitness along with questionnaires (Bortolozzo et al., 2017; Guthold et al., 2022; Rodriguez-Munoz et al., 2017; Roman-Vinas et al., 2010) in order to obtain more objective results. Moreover, we cannot generalize our results to all university employees in Romania as our study included only 126 participants from one university. For future studies, it is necessary to increase the number of participants in order to collect valuable data regarding the level of PA among university employees within their daily schedule and determine a pattern at the national level.

4. Conclusions

Questionnaire's results of the respondents may be influenced by subjectivity, and to avoid that, we asked them to make a realistic analysis of an individual level and choose the right answer for each item.

In our study, we managed to assess the level of PA among university employees, and the results of our analysis showed that over 78% of the participants met the requirements of moderate and high-level PA. The analysis by gender revealed that females were more active than males. Owing to their specific professional activity, they spent 7 hours daily on average sitting, which could enhance sedentary behavior in time. Our results and data analysis suggest that the perception of PAs in the daily life of the university employees is high, but professional activity and leisure time prevail in their schedule because they spend less than an hour daily for PA. To achieve a sustainable life quality and well-being, it is important that this category of employees be able to practice various kinds of sport activities in their leisure time in order to compensate for their professional activity. The lack of PA during daily activities means a sedentary lifestyle and possible health issues in the future.

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