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Articles

The Evaluation of the Nature of Sedentary Behavior and Physical Activities Among Students of Performing Arts

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Abstract

The aim of the research was to evaluate the nature of sedentary behavior and physical activities among students of performing arts. Two standardized questionnaires were used: the Sedentary Behavior Questionnaire (SBQ) and a modified version of the International Physical Activity Questionnaire Short Form (IPAQ Short Form). The research sample consisted of 124 students from the Faculty of Performing Arts at the Academy of Arts in Banska Bystrica. Significant differences in sedentary behavior were found between weekdays and weekends. Students spent an average of 9 hours and 42 minutes engaged in sedentary activities during weekdays and 7 hours and 33 minutes during weekends. The majority of sedentary time was dedicated to studying and class preparation (237 minutes per day) and playing a musical instrument (105 minutes per day). Moderate-intensity physical activity was reported by 48.39 % of students, while 23.39 % exhibited low levels of activity. Only 23.38 % of students achieved more than 10,000 steps per day. The results indicate a need to raise awareness about the importance of physical activity among students. It is recommended to organize lectures and workshops on the health benefits of exercise and to provide practical advice on integrating physical activity into their daily routines, taking into account their time constraints and academic commitments.

Keywords: sedentary behavior, physical activity, performing arts students, SBQ and IPAQ short questionnaire.

1. Introduction

Sedentary behavior, defined as any waking activity with an energy expenditure ≤ 1.5 METs (Metabolic Equivalents) that occurs while sitting or lying down, is currently becoming a significant factor in public health. Tremblay et al. (2017) emphasize that this behavior has a considerable negative impact on health and it is well known that students, both in secondary schools and universities, are among the most vulnerable populations. The study by Caspersen et al. (2000) analyzed changes in physical activity patterns in the United States according to gender and age. The results showed that physical activity declines significantly during adolescence, especially between the ages of 15 and 18 and this decrease continues into young adulthood. Men exhibited higher levels of physical activity and strength training compared to women, but the differences

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diminished with age. The findings suggest the need for early and continuous interventions to promote physical activity throughout adolescence and adulthood to prevent health problems associated with inactivity.

Increased sedentary behavior among adolescents and young adults leads to a heightened risk of various health complications. Owen et al. (2010) point out that prolonged sitting – even among individuals who meet the recommended levels of physical activity – is associated with serious health risks such as higher levels of glucose and triglycerides, lower levels of HDL cholesterol and an increased risk of premature mortality. The most pronounced negative effects were observed with prolonged television viewing and car sitting. Even in physically active individuals, prolonged sitting can neutralize the positive effects of exercise. The research also indicated that frequent breaks in sedentary behavior, such as regular standing, can have a beneficial impact on metabolic health, highlighting the need to focus not only on exercise but also on reducing overall sitting time during the day.

A study focused on young people aged 12 to 18 years (Salmon et al., 2011) examined the risks associated with sedentary behavior, particularly television viewing, computer use, and other screen activities. The results showed that children spend 2 to 4 hours per day in front of screens and up to 10 hours per day in sedentary activities, which is associated with a higher risk of overweight and obesity. Major factors include social and demographic status, parental behavior and the presence of a television in the bedroom. The study subsequently points out that interventions to reduce sedentary behavior have so far not been very effective. Sedentary behavior is particularly concerning in the context of university students. The study by Buckworth, Nigg (2004) examined the relationship between physical activity, exercise, and sedentary behavior in a sample of 493 university students. The findings indicate that men exhibited higher levels of involvement in physical activity and exercise compared to women but spent more time watching television and using computers. Older students more frequently used computers, while younger students scored higher on physical activity indicators. A negative correlation between sedentary behavior and exercise was observed in men concerning computer use and in women concerning television viewing. A systematic review by Thorp et al. (2011) points out that prolonged sedentary behavior, especially sitting, is significantly associated with a higher risk of metabolic syndrome, obesity and cardiovascular diseases. These health risks are present even in people who adhere to recommended levels of physical activity, suggesting that sitting time itself represents an independent risk factor for health. Park et al. (2019) found that individuals who spend more than 10 hours a day in sedentary activities have an increased risk of hyperuricemia compared to those who sit less than 5 hours a day. Conversely, regular engagement in physical activity reduces the risk of hyperuricemia. Differences were also observed according to gender and age—men and younger adults showed a higher risk due to sedentary behavior, while in women these relationships were not statistically significant.

Edelmann et al. (2022) examined the level of physical activity and sedentary behavior among university students in Germany, involving 4,351 participants. It was found that approximately 22.4 % of students do not meet the World Health Organization (WHO) recommendations for physical activity. Additionally, 47.6 % of respondents reported sitting at least 8 hours a day. Students from fields like "natural sciences, mathematics, and computer science" exhibited the highest level of sedentary behavior, while those from "social sciences, media, and sports" had the lowest. Moreover, men exhibited higher physical activity than women and non-binary students. According to Teychenne et al. (2010), prolonged sedentary behavior is also associated with an increased incidence of depressive symptoms, indicating adverse effects on mental health. The COVID-19 pandemic has significantly worsened the situation regarding sedentary behavior. Shaji et al. (2022) recorded a dramatic increase in screen time among university students during lockdown. The study noted an increase in screen time to 8 to 10 hours per day, which was double the time before the pandemic. This increase was associated with negative consequences on the physical and mental health of students, including impaired sleep quality, increased stress and eye fatigue.

During the pandemic, sleep quality also deteriorated. Marelli et al. (2021) examined the impact of lockdown during the COVID-19 pandemic on sleep quality and psycho-emotional well-being in 400 participants, including students and administrative university staff. The results showed significant deterioration in sleep quality, increased incidence of insomnia, and a rise in anxiety and depressive symptoms, especially among students and women. During lockdown, the time needed to fall asleep lengthened and bedtime and wake-up times shifted, with these

changes being most pronounced in individuals with an evening chronotype. While students had more trouble falling asleep, administrative staff exhibited difficulties maintaining sleep. The study by Godoy-Cumillaf et al. (2023) focused on examining the association between sedentary behavior, physical activity and physical fitness with Body Mass Index (BMI) and sleep duration in Chilean children aged 10 to 11 years. The research included a sample of 222 schoolchildren in this age range. It was found that 60.4 % of children did not adhere to sleep recommendations and 90.6 % did not meet physical activity recommendations. The intensity of physical activity, muscle strength and cardiorespiratory fitness were associated with BMI and sleep duration, with these associations differing by gender. The study highlights the importance of physical activity for healthy development and optimal sleep. Similar results were presented in a study by Araujo et al. (2020) among university students at a private university in Brazil (n = 303). The aim was to determine whether and how a sedentary lifestyle (e.g., long hours of sitting, lack of physical activity) affects sleep quality and BMI in this population. A significant association was found between poor sleep quality and BMI ($p = 0.001$), alcohol consumption ($p = 0.001$), smoking ($p = 0.005$), and employment ($p = 0.030$).

A systematic review examining combinations of physical activity, sedentary behavior, and sleep duration in children and adolescents – and their impact on physical, psychological, and educational outcomes – was presented by Wilhite et al. (2023). A total of 141 studies were analyzed, showing that a combination of high levels of physical activity and low levels of sedentary behavior was associated with the best outcomes in physical and mental health and educational performance. The importance of sufficient sleep proved crucial, as combinations of physical activities with adequate sleep yielded more favorable results. Students of performing arts, especially musicians, deserve specific attention, as they are exposed to prolonged sitting during practice, rehearsals and performances. The study by Kreutz et al. (2009) found that students at music conservatories exhibited varying levels of health-promoting behaviors, with physical activity and health responsibility being the most neglected. Psychosocial aspects such as interpersonal relations and spiritual growth were priorities for the students. The results also showed significant correlations between health-promoting behaviors, emotional state, self-efficacy and self-regulation. Overall, students tend to neglect the physical aspects of health in favor of psychosocial ones. This neglect subsequently negatively impacts their health status, as highlighted by the study of Zaza (1998). The results indicate that playing musical instruments is associated with an increased risk of developing musculoskeletal disorders (PRMD) among musicians. The research showed that the prevalence of these disorders ranges from 39 % to 87 % in adult musicians and from 34 % to 62 % in high school students. The best estimates of prevalence were around 39 % and 47 % in adults and 17 % in high school students. The study emphasized that these disorders are comparable to those in other professional groups and that musicians often face health problems affecting their ability to play and work. Kegelaers et al. (2021) found that classical musicians experience high levels of depression and anxiety, with music students exhibiting significantly more symptoms than professional musicians. It was also found that resilience and overall physical health are negatively associated with mental health problems, suggesting that greater psychological resilience can help reduce the risk of these issues.

Guptill et al. (2000) examined physical injuries related to playing musical instruments among university music students. They found that 87.7 % of participants had a history of playing-related injuries, with only 24.7 % seeking treatment. Most injuries involved instruments like the violin and viola, and injuries occurred across all instrument groups without statistically significant differences.

Sedentary behavior and low levels of physical activity represent serious global health risks contributing to the development of chronic diseases, especially in the adolescent population. Students of performing arts, as a specific group, are often exposed to static positions – such as individual practice, studying, and theoretical preparation – exhibiting an increased rate of sedentary behavior. Given the nature of their studies, there are no systematic requirements for regular physical activity, which increases the risk of health complications associated with a sedentary lifestyle. The lack of research in this area highlights the need to analyze movement habits and sedentary behavior to identify potential health risks and propose interventions aimed at promoting physical activity and preventing health consequences. Research in this area can have a

significant impact on maintaining long-term physical and mental well-being, which is essential for a successful and sustainable career as a musician.

2. Materials and methods

The objective of the study was to analyze the characteristics of sedentary behavior and physical activity among students of performing arts, emphasizing the time allocated to inactive pursuits, as well as the extent and motivations behind their engagement in physical activities.

Participants study

The survey was conducted among a group of 124 full-time students (64 men and 60 women) studying at the Faculty of Performing Arts at the Academy of Arts in Banska Bystrica. An adequate sample size was ensured by adhering to the following conventional criteria: known total number of full-time students ($n = 167$), margin of error of $\pm 5\%$, variance of 50% and a confidence level of 95% ($1 - \alpha$). Data collection took place over a three-month period—from April to June 2024. During this time, students had the opportunity to respond to the questionnaire. This timeframe considered not only the academic calendar but also the availability of students during the regular semester, ensuring the reliability and relevance of the results.

Experimental design study

The primary method involved two standardized questionnaires:

I. Sedentary Behavior Questionnaire (SBQ) by Rosenberger et al. (2010). The questionnaire contains 9 questions in which respondents characterize their time preferences for sedentary activities during weekdays and separately during days off.

II. International Physical Activity Questionnaire—Short Form (IPAQ Short Form). It contains 7 questions focusing on basic forms of physical activity over the past 7 days. These questions are divided into three main categories: vigorous physical activity (e.g., sports or other activities that lead to rapid breathing and increased heart rate), moderate-intensity physical activity (e.g., light sports or work) and walking. The questionnaire also includes a question about time spent sitting. Based on the responses, the total energy expenditure in MET-minutes per week is calculated and according to the scale, it is possible to determine which of the three categories of physical activity (low, moderate, high) the individual belongs to.

We chose to analyze physical activity using the IPAQ Short Form because several international studies – for example, Dinger et al. (2006); Lee et al. (2011); and Rodríguez-Muñoz et al. (2017) – have shown that the questionnaire has acceptable reliability, taking into account the fact that the study by Lee et al. (2011) points out the overestimation of physical activity levels. The questionnaire items were evaluated using automatic scoring of multiple questionnaires simultaneously (Cheng, 2016). We analyzed the SBQ responses in terms of weekdays and days off.

Data analysis

For statistical evaluation, we used the test of homogeneity of two independent samples (F-test), two-sample t-tests with equal and unequal variances at significance levels of $p < 0.01$ and $p < 0.05$ and Pearson correlation between time spent in sedentary activities during the week and the weekend. When evaluating the IPAQ Short Form, we assessed the results collectively for the entire sample of students.

3. Results

Based on the results of the analysis of television viewing, we found statistically significant differences (Table 1) between weekdays and weekends. Respondents spent more time watching television during weekends (75.12 minutes per day) compared to weekdays (55.76 minutes per day), suggesting that weekends provide more free time for passive activities. In playing games, statistically significant differences were observed at the $p < 0.05$ level in the time spent on this activity, with students spending more time gaming on weekends (23.22 min/day) compared to weekdays (13.79 min/day). This difference may be related to lower academic workload during days off, allowing more time for leisure activities.

Listening to music ($p > 0.05$) did not show statistically significant differences between weekdays (40.89 min/day) and weekends (41.98 min/day) (Table 1), indicating the stability of this activity regardless of the type of day. This suggests that music is a common part of the daily routine and is likely integrated into other activities such as studying or relaxation. Phone usage showed

slight differences between weekdays (26.01 min/day) and weekends (19.48 min/day) (Table 1), but these differences were not statistically significant ($p > 0.05$), indicating that the phone remains a stable means of communication and entertainment throughout the week.

Time spent studying and working on a computer showed statistically significant differences ($p < 0.01$) between weekdays and weekends, with respondents spending significantly more time on the computer during weekdays (237.33 min/day) compared to weekends (101.97 min/day). This difference reflects increased academic demands during the week, leading to longer time spent working on assignments. Reading books did not show statistically significant differences ($p > 0.05$), with values of 27.70 min/day during weekdays and 24.07 min/day over weekends. Playing a musical instrument ($p < 0.05$) showed higher time spent on this activity during weekdays (105.97 min/day) than during weekends (89.52 min/day), indicating regular practice and academic obligations associated with artistic education, which are more intense during the week.

Time spent on artistic work during weekdays and weekends did not show statistically significant differences ($p > 0.05$), with students dedicating only 5.93 min/day to artistic work during the week, and this increase was not significant during weekends—11.85 min/day. This indicates that artistic work represents only a negligible part of leisure activities for students of performing arts, regardless of the days of the week. Travel ($p < 0.05$) was another area where no significant differences were recorded between weekdays and weekends. Time spent traveling during weekdays was 68.95 min/day, and during days off, this time slightly decreased to 66.41 min/day.

The evaluation of the overall sedentary behavior of performing arts students showed significant differences ($p < 0.01$) between weekdays (9 hours and 42 min/day) and weekends (7 hours and 33 min/day), indicating increased sedentary activity during the week, which is dominantly influenced by academic obligations such as computer work, studying, or playing a musical instrument, which are essential activities for successful completion of studies.

Table 1. Evaluation of SBQ Questionnaire Items (minutes per day) and Their Statistical Analysis

Type of Sedentary Behavior	Weekday	Weekend	Average	p-value
Watching Television	55.77	75.12	65.44	$p = 0.025^*$
Games	13.79	23.23	18.51	$p = 0.045^*$
Listening to Music	40.89	41.98	41.43	$p = 0.840$
Activities with Phone	26.01	19.48	22.74	$p = 0.078$
Learning and Working on Computer	237.34	101.98	169.66	$p = 3.47 \text{ E-}19^{**}$
Reading Books	27.7	24.07	25.89	$p = 0.449$
Playing a Musical Instrument	105.97	89.52	97.74	$p = 0.043^*$
Artistic Activities	5.93	11.85	8.89	$p = 0.036^*$
Traveling	68.95	66.41	67.68	$p = 0.804$
Total (hour/min)	9:42	7:33	8:38	$p = 2.86 \text{ E-}06^{**}$

*Statistical significance: $*p < 0.05$; $**p < 0.01$

The analysis of differences in time spent on sedentary activities during the week and the weekend revealed several significant trends. The largest discrepancy was observed in the activity of studying and computer work, with a difference of 135.36 minutes. This suggests that this activity is primarily associated with work or study obligations that are predominant on weekdays. In contrast, leisure activities such as playing games and watching television exhibited an opposite trend. During the weekend, the average time devoted to these activities increased, with an average rise of 9.44 minutes for playing games and 19.35 minutes for watching television. This increase indicates that the weekend period is characterized by a higher proportion of leisure and recreational activities. The overall results suggest that the temporal distribution of sedentary activities differs significantly between the week and the weekend, reflecting changes in individuals' priorities and activities. While weekdays are more focused on productive and obligatory tasks, weekends are

marked by rest and entertainment. Correlation analysis between time spent in sedentary behavior during the week and the weekend revealed a strong positive correlation of 0.86. This means that students who spend more time on sedentary activities during weekdays tend to maintain this behavior during weekends. A higher level of sedentary behavior during the week is associated with a similarly high level of sedentary activities during days off.

A summary evaluation of the questionnaire survey using the IPAQ Short Form revealed that moderate-intensity physical activity dominates among students of performing arts, with nearly half of the students (48.39 %) meeting this level. Only 28.23 % of students engage in vigorous physical activity during the week, while almost a quarter (23.39 %) displays low levels of physical activity. Vigorous physical activity was performed on average for 43.58 minutes but only approximately 1.77 times per week, corresponding to an energy expenditure of only 706.38 MET-min/week for this activity. Students engaged in moderate-intensity physical activity for an average of 46.22 minutes, about 2.32 times per week. This type of activity includes exercises that require a level of effort causing slightly heavier breathing than usual. Moderate-intensity activity contributed to an energy expenditure of 514.90 MET-min/week, which, although slightly lower, still represents a substantial portion of the total energy expenditure. The most common form of physical activity was walking, performed on average for 80.97 minutes about 4.53 times per week, indicating that walking represents the most significant form of daily movement for students. This form of activity is clearly the most frequent among students, with an energy expenditure of 987.87 MET-min/week. The total energy expenditure for all activities was 2 209.16 MET-min/week, indicating that students engage in various forms of physical activities, with walking and moderate-intensity activities prevailing over more intense forms of movement. The average time spent in sedentary behavior, evaluated using the IPAQ Short Form, was 6.97 hours per day. The daily step count showed that up to 54.84 % of students take between 6,000 and 10 000 steps per day, and only 23 % of students exceed the recommended 10 000 steps per day. Only 4.03 % of students meet the threshold of more than 15 000 steps per day. Notably, 21.77 % of students record fewer than 6 000 steps per day. The physical activities of students are predominantly recreational in nature (69.35 %), with only 20 % of students being actively involved in a sports club.

From the preferences for sports or activities, it is evident that 58.06 % of students prefer individual sports (activities), while 22.58 % prefer team sports (activities). These results suggest that the majority of students favour activities they can engage in independently, which may be related to personal preferences or scheduling constraints. The key factor influencing participation in physical activities, as identified by the students, was a lack of time (Table 2), with 63.70 % of respondents indicating this in their responses. Other important factors included alternative ways of spending free time (9.68 %) and the limited availability of facilities near their residence (8.06 %).

Table 2. The main obstacle preventing participation in physical activities

Reason for Not Engaging in Physical Activities	Percentage (%)
I do not engage in physical activities	0.81
Lack of support from parents/partner	0.81
Lack of friends to participate in physical activities	4.03
Health problems	5.65
High financial cost	7.26
Limited availability of facilities near residence	8.06
Other ways of spending free time	9.68
Lack of time	63.70
Total	100

The survey results show that the most common reason students engage in physical activities is to improve and maintain health (35.48 %), indicating an awareness of the importance of physical activity in supporting a healthy lifestyle. A large portion of students also cited mental relaxation (20.97 %) and enjoyment of movement (20.16 %). Aesthetic reasons, such as improving one's physique (16.13 %) and weight loss (4.84 %) are less common, while establishing social contacts (0.81 %) and not participating in physical activities (1.61 %) are rarely identified as primary motivations for engaging in physical activities among students.

4. Discussion

Our findings regarding television consumption and gaming during weekends are consistent with existing empirical studies. Sanz et al. (2005) found that adolescents spend more time watching television during weekends, averaging 3.2 hours per day, compared to slightly less time during weekdays, at an average of 3 hours per day. A similar trend was observed in video game play, where the time spent on this activity increased to 1.09 hours per day on weekends compared to 0.69 hours per day during weekdays. The observation that students devote more time to gaming and watching television over weekends is also described in the study by Jiang et al. (2014), which noted this trend in the adolescent age group, revealing that boys spend more time in front of screens than girls, particularly on weekends. Our findings showed that time spent listening to music does not exhibit statistically significant differences between weekdays and weekends, indicating that music is an integral part of students' daily activities, with an average listening time of 41 minutes per day. The study by North et al. (2000) demonstrated that adolescents listen to music to a much greater extent – on average 2.45 hours per day—with genres such as pop, dance, and rap being the most popular. They found that music plays an important role in the daily lives of young people, often used to regulate emotions, strengthen identity, and improve mood. Music becomes a tool for young people to manage stress and social challenges, while also serving as a means to express personal style and group identity. In the case of time spent studying and working on a computer, we recorded statistically significant differences between weekdays and weekends ($p < 0.01$), with respondents spending significantly more time on the computer during weekdays—237.33 minutes per day. The study by Skrbinjek (2023) analyzed how much time students dedicate to studying and what factors influence their time allocation. The research included 290 students from Slovenia, who answered questions about their study time. The results showed that 43 % of students studied for an average of 3 to 6 hours per day, while 40 % spent more than 7 hours per day on studying. The main factors affecting study time included leisure time, work and family obligations. The study also found that 64 % of students experienced stress related to their studies. The results suggest that one of the main reasons for the large amount of time spent studying may be poor time management, which leads to the need for better coordination between studying and leisure activities. Additionally, 27 % of students reported that the amount of time they spent studying depended on the difficulty of their study program and 40 % believed that their study time was influenced by their leisure time.

As for reading books, the differences between weekdays and weekends were not statistically significant ($p > 0.05$). Respondents read for an average of 25.89 minutes per day, indicating that reading remains a relatively consistent activity regardless of the day of the week. The study by Zebroff, Kaufman (2016) analyzed the impact of various daily habits on adolescent literacy and found that the use of text messaging did not show a significant relationship with literacy development. On the contrary, traditional reading in print, electronic, or online form was more strongly associated with higher literacy levels. The authors emphasize that while the time spent on digital activities like texting is increasing, the time dedicated to traditional reading remains low. They recommend focusing on increasing the amount and complexity of traditional reading during adolescence to support the development of functional literacy in society (Zebroff, Kaufman, 2016).

Kozaňáková et al. (2023) found that students ($n = 220$) dedicated almost identical amounts of time to reading books, magazines, etc., during the week and weekends, with an average reading time of 24.58 minutes per day, values that are very close to our findings. Playing a musical instrument showed higher time spent on this activity during weekdays (105.97 minutes per day) compared to weekends (89.52 minutes per day) and this difference was statistically significant ($p < 0.05$). The study by Nusseck, Spahn (2021) found that during the lockdown, the average time spent practicing by music students decreased to approximately 2 hours per day, which was less than before the pandemic. This decrease was most pronounced among undergraduate music students, who lost opportunities for concerts and rehearsals. In contrast, students preparing for teaching careers increased their practice time due to canceled or online seminars, allowing them to dedicate more time to practice. The study also showed that during the lockdown, students exhibited higher levels of self-regulation in learning and adapted to the new conditions by moving their practice home to their parents. At the same time, their participation in physical activities significantly increased, which could have positively impacted their overall well-being (Nusseck, Spahn, 2021). Our findings also show that the time spent on artistic work during weekdays and

weekends did not differ significantly ($p > 0.05$), nor did the time spent traveling, with no significant differences observed between weekdays and weekends ($p > 0.05$).

According to Matuščáková (2019) the average Slovak spends 46 minutes commuting to work each day and a survey conducted by Grafton Slovakia with a sample of 1,095 respondents showed that Slovaks' commute to work most frequently takes 20 to 30 minutes, as reported by 30 % of participants (Regely, 2018). Our findings are consistent with those of Kozaňáková et al. (2023), who found that undergraduate students from the Academy of Police Corps in Bratislava spend an average of 62.25 minutes per day commuting, with no statistically significant differences in commuting time between weekdays and weekends. In terms of physical activities, interesting findings are described in the study by Bray, Born (2004) ($n = 145$), which points out that transitioning to university leads to a decline in the level of vigorous physical activity, with only 44.1 % of students meeting the standard for physical activity during the first eight weeks at university. This decline in activity was associated with higher levels of fatigue and lower levels of energy.

The study by Vašíčková et al. (2008) analyzed the level of adherence to physical activity recommendations among Czech university students. Based on the International Physical Activity Questionnaire (IPAQ) – short version, the physical activity of 2 400 students from various universities was collected and analyzed. The results showed that more than 85 % of students meet the general recommendations for physical activity (3×20 minutes of vigorous PA or 5×30 minutes of moderate PA or walking per week). The study found that the most significant factors influencing adherence to the recommendations were regular participation in organized physical activity and cycling. The study also highlighted the need to promote moderate-intensity physical activity, which was met by only 19 % of students. Pastuszek et al. (2014) conducted a study that examined the level of physical activity of physical education students using the International Physical Activity Questionnaire (IPAQ). The research included 146 students, 50 from Charles University (KU) and 96 from the University of Physical Education in Warsaw (UPE). The results showed that KU students exhibited significantly higher levels of physical activity compared to their peers in Warsaw. The average total physical activity per week was 9 525.2 MET-min/week for men and 10 964.3 MET-min/week for women at KU, while at UPE, men achieved an average of 4,034.3 MET-min/week and women 2 469.8 MET-min/week, which corresponds to our findings (2 209.16 MET-min/week). This difference was strongly influenced by the students' participation in sports competitions and events, which increased their overall level of physical activity. The study also pointed out that meeting WHO recommendations, which set the minimum level of physical activity at 1 200 MET-min/week, significantly improves students' health and well-being, while also emphasizing the need for stricter monitoring and support of physical activity within educational institutions. Puello-Beltrán, Molina (2015) investigated the sociodemographic and motivational factors that influence the level of physical activity among university students in Colombia. The study involved 900 students with an average age of 20, of whom 60 % were women (IPAQ and MPAM-R questionnaires were used). The results showed that 22 % of students achieved a high level of physical activity, 54.8 % exhibited a low level, and 13.9 % were considered inactive. According to the MET consumption evaluation, 68.9 % of students were inactive, and only 16.8 % achieved a very high level of physical activity.

In terms of MET values, the study showed that the average MET value achieved by students was 1 114.1 MET-minutes per week. The average MET values for different types of physical activity were 614.5 MET-minutes per week for vigorous activities, 201.4 MET-minutes for moderate-intensity activities, and 319.5 MET-minutes for walking. Men engaged in more intense physical activity than women, as reflected in higher MET values: men achieved an average of 733.2 MET-minutes per week for vigorous activities, 220.9 MET-minutes for moderate activities, and 331.8 MET-minutes for walking, while women achieved 535.8 MET-minutes, 188.6 MET-minutes, and 311.3 MET-minutes per week for the same activities. The study's results also indicated that as many as 92 % of active students engaged in physical activity for health-related reasons. From a motivational perspective, health reasons were the most important for active students (92.2 %), followed by enjoyment (84.8 %) and a competitive spirit (82.6 %). On the other hand, physical appearance and social motivation played a smaller role. Significant differences in motivation for social interaction were observed between genders, with men showing higher levels of this motivation than women. The study conducted by Dabholkar et al. (2018) focused on the level of physical activity among physiotherapy students aged 18 to 25 years, using the IPAQ short form.

The study examined 450 students, including 48 men and 402 women. It found that 39 % of students were physically inactive (less than 600 MET-minutes per week), 50 % of students achieved moderate levels of activity (600–3000 MET-minutes per week), and 11 % of students reached vigorous levels of physical activity (more than 3000 MET-minutes per week). The analysis of physical activity in relation to BMI revealed several key findings: underweight individuals had the highest proportion of inactive people (53 %) and the lowest proportion of those who were highly physically active (8 %). Obese individuals showed a higher proportion of those who were highly active (26 %) compared to normal (10 %) and underweight individuals (8 %). Overweight individuals had the lowest proportion of inactive people (27 %) and the highest proportion of moderately active people (56 %). Normal-weight individuals were mostly moderately active (51 %), with 39 % being inactive and 10 % highly active.

Miloshova (2019) focused on the level of physical activity among university students in Sofia, Bulgaria and used the IPAQ to assess 435 respondents aged 19 to 29 years (average age 23.3 ± 2.3 years). Of all respondents, 238 were men and 197 were women. The results showed that 12 % of respondents did not engage in any physical activity except walking. The majority of students participated in physical activities twice a week, with men preferring more intense activities and spending an average of 1.5 hours per day on physical activity, while women preferred moderate activities and exercised for about an hour a day. The average time spent sitting was approximately 7 hours per day for both genders. Most students (58.6 %) engaged in a combination of vigorous and moderate physical activity. Men demonstrated higher levels of physical activity compared to women, with their total energy expenditure reaching 6757.6 MET-minutes per week, while for women, it was 4825 MET-minutes per week. The differences between genders were statistically significant, with men preferring more intense and longer-lasting physical activities. The study by Bhavani, Devi (2019) focused on the physical activity patterns of male college students in Chennai, India ($n = 500$; age 19–22 years). It was found that only 41.4 % of respondents regularly engaged in physical activity. The most commonly performed activities were walking (34.3 %) and gym exercises (30 %). Most students (49.8 %) engaged in physical activity only 0–2 days per week. The main reasons for engaging in physical activity were enjoyment (41.5 %) and maintaining fitness (23.2 %). The biggest barrier was a lack of time (32 %). The study by Dikmen et al. (2020) focused on examining the level of physical activity among university students and gender differences (using the IPAQ). The research was conducted in the 2014–2015 academic year, involving 510 students from seven faculties of Sakarya University in Turkey – 80% women and 20 % men. The analysis of student physical activity showed that 32.8% of them were physically inactive, 49.2 % showed low levels of physical activity, and only 18 % achieved sufficient levels of physical activity necessary for maintaining health. Significant differences in total physical activity were found between genders: male students achieved an average higher score (2346 MET-minutes per week) compared to female students (1823 MET-minutes per week). Men also showed higher intensity in both vigorous and moderate physical activities. On the other hand, no significant differences were observed between genders in the time spent walking or sitting. Regarding Body Mass Index (BMI), students with a BMI over 25 kg/m^2 did not show significant differences in the level of physical activity. However, students with a BMI below 25 kg/m^2 demonstrated higher overall physical activity, with male students achieving higher values than female students.

The study by Dragić et al. (2020) analyzed the level of physical activity among students from four faculties at the University of Niš, which do not include physical education in their curriculum. The research was conducted on a sample of 109 students (average age 22 years) using the long version of the IPAQ. The results revealed significant differences in the level of physical activity across faculties. Law students showed the highest level of physical activity in occupational activities, while Philosophy students were the most active during their leisure time. Significant differences were found in all types of activities except for leisure activities, where no differences were observed. Keneni, D'Souza (2021) in their study (using IPAQ) among sports science students at Oromia State University in Ethiopia, found that 54.1 % of men engaged in vigorous physical activity, while only 9.0 % of women did the same. On the other hand, 51.1 % of women fell into the low physical activity category, compared to only 11.3 % of men. The study also showed that students aged 22–25 years had the highest levels of physical activity (44.9 %), while this age group also had the lowest percentage of low physical activity (17.4 %). Additionally, students with normal

body weight (BMI) had the highest percentage of vigorous physical activity (41.9 %), while obese students exhibited only low levels of physical activity.

5. Conclusion

The results of the analysis showed statistically significant differences in activities between weekdays and weekends. Television watching and gaming ($p < 0.05$) were dominant during weekends, while the time dedicated to intensive academic activities such as studying and computer work ($p < 0.01$) and playing a musical instrument ($p < 0.05$) was significantly higher during weekdays. Statistically significant differences were also demonstrated in the evaluation of overall sedentary behavior, where students exhibited much higher levels of passive activities on weekdays compared to weekends ($p < 0.01$). Physical activity was predominantly of moderate intensity, with walking being the most common form, while more intense forms of exercise were less frequent. The metabolic equivalent (METs) provided clear evidence that walking constitutes the most significant part of total energy expenditure. Although vigorous physical activities have a high energy expenditure per unit of time, their contribution to overall energy output among performing arts students is relatively low, as they dedicate less time to these activities. This suggests that daily, lower-intensity physical activities may play a crucial role in maintaining energy balance in performing arts students.

From a practical perspective, it appears necessary to encourage students to reduce sedentary behavior during weekdays, particularly by introducing regular physical breaks. Increasing the level of vigorous physical activity should be a key priority in order to optimize energy expenditure and improve overall physical fitness. More effective time management could help overcome the lack of time and space for physical activities, which was reported by the majority of respondents.

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7. Conflict of interest

The authors declare that there is no conflict of interest.

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