

The role of fitness and wellness activities in the lifestyle of university students. A geographical analysis of their impact on health and academic performance

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Abstract: Regular physical activity is an important component of a healthy lifestyle and may contribute to improved well-being, reduced stress, and better academic outcomes among university students. This study aimed to analyze the relationship between physical activity levels, perceived health, energy, stress, and academic performance among students from the Faculty of Physical Education and Mountain Sports. A quantitative, cross-sectional research design was used. The sample consisted of 141 university students, including 76 females and 65 males. Data were collected using the International Physical Activity Questionnaire – Short Form (IPAQ-SF), together with additional items assessing perceived health, energy level, stress, grade point average, and concentration. Descriptive statistics, Pearson correlation analysis, and independent samples t-tests were applied. The results showed that most participants reported moderate to high levels of physical activity, with a mean value of 2146.39 MET-min/week. Physical activity was positively correlated with perceived health, energy level, GPA, and concentration, and negatively correlated with perceived stress. Stress was negatively associated with both academic performance and concentration. Gender comparisons indicated that female students reported significantly higher stress levels than male students, while no significant gender differences were found for physical activity, perceived health, energy, GPA, or concentration. These findings suggest that physical activity is closely connected with students' physical and psychological well-being and may support academic performance by reducing stress and improving energy and concentration. Conclusions: The study highlights the need for university programs that promote fitness and wellness activities as part of student development strategies.

Keywords: physical activity, university students, wellness, stress, academic performance

Introduction

Physical activity plays an essential role in maintaining health and well-being across all age groups, with strong evidence supporting its benefits for both physical and mental health (Warburton et al., 2006; WHO, 2020). In young adults, particularly university students, regular engagement in physical activity contributes to improved cardiovascular fitness, body composition, and psychological functioning (Bize et al., 2007; Keating et al., 2005). The university period represents a critical

stage in the development of lifestyle behaviors. During this time, students often experience significant changes in daily routines, academic demands, and social environments, which can influence their physical activity patterns and overall well-being (Irwin, 2004; Haase et al., 2004). Research shows that many students reduce their level of physical activity after entering university, which may negatively affect their health and academic performance (Bray & Born, 2004). At the same time, university students frequently report high levels of stress, mainly due to academic pressure, time constraints, and adaptation to new environments (Pascoe et al., 2020; Bayram & Bilgel, 2008). Elevated stress levels can impair concentration, reduce academic performance, and negatively impact mental health (Saleh et al., 2017). Identifying factors that can reduce stress and improve coping mechanisms is therefore essential in the academic context.

Physical activity has been identified as an effective strategy for reducing stress and improving psychological well-being. Regular exercise is associated with lower levels of anxiety and depression, as well as improved mood and cognitive function (Salmon, 2001; Gerber & Pühse, 2009). These benefits are particularly relevant for students, who must maintain both physical and mental balance to achieve academic success. In addition to its effects on health, physical activity has been linked to academic performance. Studies indicate that students who engage in regular physical activity tend to achieve better academic results, likely due to improved concentration, memory, and executive function (Castelli et al., 2007; Singh et al., 2012; Donnelly et al., 2016). These findings support the integration of physical activity into educational strategies aimed at enhancing student outcomes.

The concept of wellness extends beyond physical activity and includes factors such as perceived health, energy levels, and stress management. A balanced lifestyle that combines physical activity with wellness practices can support both academic performance and long-term health (Biddle & Asare, 2011; WHO, 2020). In this context, assessing multiple dimensions of student life provides a more comprehensive understanding of their well-being (Onea et al., 2018).

Students enrolled in faculties of physical education and mountain sports represent a unique population. Due to the nature of their academic programs, they are expected to engage in more physical activity than other students. However, variability still exists within this group, influenced by individual motivation, lifestyle, and academic demands (Troost et al., 2002). Exploring these variations can provide insights into how physical activity interacts with other factors such as stress and academic performance.

Geographical context also plays a role in shaping physical activity behaviors. Access to natural environments, such as mountainous areas, can encourage outdoor activities, recreation, and active lifestyles (Pretty et al., 2005; Thompson Coon et al.,

2011). For students studying in regions with access to such environments, opportunities for engagement in physical activity may be enhanced, contributing to improved well-being.

Despite the growing body of literature on physical activity and student health, there is still a need for studies that integrate multiple dimensions, including fitness, wellness, stress, and academic performance, within a specific educational context. Understanding these relationships in students of physical education can provide valuable insights for both academic institutions and public health strategies.

Therefore, the aim of this study is to analyze the relationship between physical activity levels, perceived health, energy, stress, and academic performance among students of the Faculty of Physical Education and Mountain Sports. The study seeks to identify patterns that can support the development of effective interventions aimed at improving both well-being and academic outcomes.

Methodology

The study employed a quantitative, cross-sectional design, aiming to analyze the relationship between physical activity, fitness-related behaviors, and selected health and academic indicators among university students. Data collection was conducted over a period of four weeks, during the second semester of the academic year, between 09.02 and 10.03.2026.

The sample consisted of 141 participants, of whom 76 were female and 65 male. All participants were students of the Faculty of Physical Education and Mountain Sports. The selection was carried out through convenience sampling, based on participants' availability and willingness to participate. Of the total number, 76 participants were female, representing 53.9%, and 65 were male, representing 46.1%. The distribution by year of study was balanced, with 47 students enrolled in each academic year, corresponding to 33.3% for Year 1, Year 2, and Year 3, respectively. The mean age of the participants was 20.4 years, with a standard deviation of 1.2, indicating a relatively homogeneous age group.

Data collection was conducted using a structured questionnaire that included the International Physical Activity Questionnaire, short form, IPAQ-SF, a standardized and internationally validated instrument. The IPAQ-SF assessed the frequency and duration of vigorous physical activity, moderate physical activity, walking, and sedentary behavior over the last seven days.

In addition to the IPAQ-SF, the questionnaire included supplementary sections. The questionnaire was structured into several sections. The first section included socio-demographic data, such as age, gender, and year of study. The second section focused on physical activity and was based on the International Physical Activity Questionnaire, short form (IPAQ-SF), assessing vigorous and moderate

physical activity, walking, as well as sedentary behavior, in terms of frequency and duration. The third section addressed perceived health status and daily energy levels, including self-evaluation of general health and fatigue. The fourth section examined perceived stress, including the frequency of stressful situations, the ability to manage stress, and perceived academic pressure. The final section targeted academic performance, including grade point average, level of concentration during study, and self-perceived academic efficiency. The IPAQ data were processed according to official scoring protocols, and results were expressed in MET (Metabolic Equivalent of Task) -minutes per week. Physical activity levels were classified according to IPAQ scoring guidelines into low, moderate, and high categories. MET-min/week represents the total volume of physical activity calculated based on frequency, duration, and intensity of activities performed during the last seven days. Based on these values, participants were classified into three categories of physical activity levels, low, moderate, and high.

Data analysis were computed in IBM SPSS v.26 and included descriptive statistics, means and standard deviations, as well as Pearson correlation analysis to examine relationships between physical activity levels and the selected variables. The level of statistical significance was set at $p < 0.05$. Although the Shapiro-Wilk test indicated deviations from normality ($p < 0.05$), parametric tests were applied due to the relatively large sample size ($n = 141$), which allows strength of parametric methods under non-normal conditions.

This study respects ethical standards for research involving human participants. Participation was voluntary and based on informed consent obtained before data collection. Participants received clear information about the purpose of the study, the type of data collected, and their right to withdraw at any time without consequences. All responses were collected anonymously, and no personal identifiers were recorded, which ensured confidentiality and data protection. The data were used only for scientific purposes and stored securely. The study followed the ethical principles of the Declaration of Helsinki for research involving human subjects. Ethical approval was obtained from the institutional Ethics Committee under document no. 443/05.02.2026.

Results and discussion

The The results from Table 1 show that the sample is homogeneous in terms of age, with a mean of 20.51 years and a low variability, $CV = 6.74\%$. The narrow confidence interval confirms the consistency of this variable. Physical activity presents the highest variability, with a mean of 2146.39 MET-min/week and a very high CV of 78.75%. This indicates large differences between participants, from very

low to very high activity levels. The wide confidence interval supports this dispersion.

Table 1. Descriptive statistics of main study variables

Variable	X	SD	(95% CI)		CV%	Kurtosis	p
			LL	UL			
MET-min/week	2146.39	1690.31	1867.74	2425.04	78.75	-0.38	< 0.01
Perceived health (1-5)	3.82	0.95	3.66	3.98	24.78	-0.95	< 0.01
Energy level (1-5)	3.82	1.00	3.65	3.99	26.21	-1.02	< 0.01
Perceived stress (1-5)	2.96	1.16	2.77	3.15	38.97	-0.79	< 0.01
GPA (1-10)	8.07	1.00	7.90	8.24	12.37	-0.31	< 0.01
Concentration (1-5)	3.96	0.89	3.81	4.11	22.58	-0.74	< 0.01

Note. X = Mean; SD = Standard deviation; LL = lower limit of the 95% confidence interval; UL = upper limit of the 95% confidence interval; CV% = coefficient of variation; MET, Metabolic Equivalent of Task; GPA = Grade Point Average; p = Statistical significance threshold.

Perceived health and energy levels show similar mean values, 3.82, with moderate variability. This suggests that most students report a relatively good health status and energy level. The kurtosis values indicate a slightly flattened distribution. Perceived stress has a lower mean, 2.96, but a higher variability, CV = 38.97%. This shows that stress levels differ considerably among students. Academic performance is relatively high, with a mean GPA of 8.07 and low variability, CV = 12.37%. This indicates consistent academic results across the sample. Concentration levels are also relatively high, mean 3.96, with moderate variability.

The Shapiro-Wilk test shows p values below 0.05 for all variables. This indicates that the data are not normally distributed. This result supports the use of non-parametric tests or careful interpretation of parametric analyses.

Table 2. Physical activity levels based on IPAQ

Variable	Category	n	%	Mean ± SD
Physical activity level	Low	42	29.8	-
	Moderate	56	39.7	-
	High	43	30.5	-
Total physical activity	MET-min/week	-	-	2146.39 ± 980.3

Note: n = number of subjects; % = percent of total number of subjects.

The distribution of physical activity levels indicates in Table 2 that most students reported a moderate level of physical activity, accounting for 39.7% of the sample. A similar proportion of participants showed high levels of physical activity (30.5%), while 29.8% were classified in the low activity category. These results suggest that a large part of the sample maintains an active lifestyle, which aligns with the specific profile of students enrolled in a Faculty of Physical Education and Mountain Sports. The relatively balanced distribution across the three categories

highlights variability in activity patterns, even within a population expected to be physically active.

The mean value of total physical activity, 2146.39 MET-min/week, indicates an overall moderate to high level of physical engagement. This value exceeds the minimum thresholds recommended for health benefits, which supports the assumption that most participants achieve adequate levels of physical activity. The absence of missing data strengthens the reliability of the results and allows for accurate interpretation of the distribution.

Table 3. Pearson correlations between physical activity, health, stress, and academic performance

Variable	1	2	3	4	5
1. MET-min/week	1				
2. Perceived health	0.52**	1			
3. Energy level	0.55**	0.61**	1		
4. Perceived stress	-0.48**	-0.53**	-0.57**	1	
5. GPA	0.41**	0.46**	0.49**	-0.44**	1
6. Concentration	0.45**	0.50**	0.54**	-0.47**	0.58**

Note. MET = Metabolic Equivalent of Task; ** = $p < 0.01$; GPA = Grade Point Average.

The results from Table 3 show several significant relationships between physical activity, health, stress, and academic performance. Physical activity, expressed in MET-min/week, is positively correlated with perceived health, $r = 0.52$, and energy level, $r = 0.55$. This indicates that students who are more physically active report better health and higher energy. At the same time, physical activity is negatively correlated with perceived stress, $r = -0.48$, which shows that more active students tend to experience lower stress levels.

Perceived health is strongly associated with energy level, $r = 0.61$, and negatively associated with stress, $r = -0.53$. This suggests that students who feel healthier also report higher energy and lower stress. Energy level shows a strong negative correlation with stress, $r = -0.57$, indicating that higher energy is linked to lower perceived stress. Energy is also positively correlated with academic performance indicators, including GPA, $r = 0.49$, and concentration, $r = 0.54$. Perceived stress is negatively correlated with GPA, $r = -0.44$, and concentration, $r = -0.47$. This shows that higher stress is associated with lower academic performance and reduced ability to concentrate. GPA is positively correlated with concentration, $r = 0.58$, indicating that better academic results are associated with higher levels of focus during study.

All correlations are statistically significant at $p < 0.01$. The results support the idea that physical activity plays an important role in improving both well-being and academic outcomes among students.

Table 4. Differences in physical activity, health, stress, and academic performance by gender

Variable	Mean \pm SD (F)	Mean \pm SD (M)	t	p
MET-min/week	1985.30 \pm 1620.45	2335.60 \pm 1755.20	-1.21	0.228
Perceived health (1-5)	3.75 \pm 0.97	3.90 \pm 0.92	-0.98	0.329
Energy level (1-5)	3.70 \pm 1.02	3.96 \pm 0.95	-1.54	0.126
Perceived stress (1-5)	3.15 \pm 1.12	2.73 \pm 1.18	2.16	0.032
GPA (1-10)	8.12 \pm 0.95	8.01 \pm 1.05	0.64	0.523
Concentration (1-5)	3.88 \pm 0.91	4.05 \pm 0.86	-1.12	0.264

Note. Values are expressed as mean \pm standard deviation. t = Independent samples t-test value; SD = standard deviation; MET = Metabolic Equivalent of Task; GPA = Grade Point Average; p = statistical significance threshold.

The results show that most variables do not present statistically significant differences between female and male students. Physical activity levels are higher in male students, mean 2335.60 MET-min/week, compared to females, 1985.30 MET-min/week, but the difference is not statistically significant, $p = 0.228$. This suggests similar activity patterns between genders within this specific academic context. Perceived health and energy levels are slightly higher in male students, but the differences are not significant, $p > 0.05$. Both groups report comparable levels of well-being. A statistically significant difference appears in perceived stress, $p = 0.032$. Female students report higher stress levels, mean 3.15, compared to males, mean 2.73. This indicates that gender influences stress perception in this sample. Academic performance, measured through GPA, shows no significant difference between groups, $p = 0.523$. Both female and male students achieve similar academic results. Concentration levels are slightly higher in male students, but the difference is not statistically significant, $p = 0.264$ (Table 4).

These findings indicate that gender has a limited influence on most variables, with the exception of stress, where female students report higher levels.

The present study analyzed the relationship between physical activity, health status, stress, and academic performance among students enrolled in the Faculty of Physical Education and Mountain Sports. The findings highlight several relevant patterns that contribute to understanding the role of active lifestyles in a university context. The results indicate that most participants reported moderate to high levels of physical activity. This finding aligns with previous research showing that students enrolled in sport-related programs tend to maintain higher activity levels compared to the general student population (Keating et al., 2005; Irwin, 2004). The mean value of MET-min/week further supports the presence of an active profile within the sample, exceeding minimum thresholds recommended for health benefits (Craig et al., 2003).

A significant positive association was identified between physical activity and perceived health, as well as energy levels. These findings are consistent with earlier studies demonstrating that regular physical activity improves both physical and psychological well-being (Warburton et al., 2006; Bize et al., 2007). Students who engage in higher levels of physical activity tend to report better overall health and increased vitality, which supports the role of exercise as a key factor in maintaining well-being in young adults. The negative relationship between physical activity and perceived stress observed in this study is also supported by existing literature. Regular exercise has been shown to reduce stress levels through physiological and psychological mechanisms, including improved mood regulation and reduced cortisol levels (Salmon, 2001; Gerber & Pühse, 2009). The present findings reinforce the idea that physically active students are better equipped to cope with academic and daily stressors.

Energy level emerged as an important variable (Teris et al., 2024), showing strong positive correlations with both health and academic performance. This result is in line with previous research indicating that higher energy and vitality contribute to improved cognitive functioning and academic engagement (Castelli et al., 2007; Donnelly et al., 2016). Students with higher energy levels tend to concentrate better and achieve higher academic results. Perceived stress showed a significant negative association with both GPA and concentration. This finding confirms that stress can negatively affect academic performance, reducing focus and efficiency (Pascoe et al., 2020). Students experiencing higher stress levels may struggle to maintain consistent academic outcomes, which highlights the importance of stress management strategies within academic environments.

The analysis of gender differences revealed that female students reported significantly higher stress levels compared to male students. This result is consistent with previous studies that indicate higher perceived stress among female university students (Bayram & Bilgel, 2008; Saleh et al., 2017). However, no significant differences were observed in physical activity, health, or academic performance, suggesting that both genders maintain similar functional outcomes despite differences in stress perception. The lack of significant gender differences in physical activity contrasts with some studies that report higher activity levels in males (Troost et al., 2002; Badau et al., 2019), but it can be explained by the specific profile of the sample. Students enrolled in physical education programs are more likely to engage in structured physical activity regardless of gender.

Academic performance, measured through GPA, showed positive associations with both physical activity and concentration. These findings support previous research suggesting that physical activity contributes to improved academic outcomes through enhanced cognitive function and mental health (Singh et al.,

2012; Álvarez-Bueno et al., 2017). The strong relationship between concentration and GPA further emphasizes the role of cognitive engagement in academic success. The high variability observed in physical activity levels suggests that, even within a specialized academic context, students adopt different lifestyle patterns. This variability has also been reported in other studies focusing on university populations (Haase et al., 2004), indicating that individual differences remain important even among physically active groups.

The findings support the idea that physical activity plays a central role in promoting health, reducing stress, and supporting academic performance. The integration of fitness and wellness practices into student life appears to offer measurable benefits across multiple domains.

The study has several limitations that should be considered when interpreting the results. The sample includes students from a single faculty, which limits the generalization of the findings to other student populations. The specific profile of students in physical education may influence the high levels of physical activity observed.

Data were collected using self-reported questionnaires. This approach may introduce bias, as participants can overestimate or underestimate their physical activity, health status, or academic performance. The use of IPAQ, although validated, still relies on subjective reporting.

The cross-sectional design does not allow causal relationships to be established. The results show associations between variables, but it is not possible to determine directionality. For example, higher physical activity may lead to better academic performance, but it is also possible that more organized students are both more active and more successful academically.

Another limitation is the absence of objective measurements, such as wearable devices for physical activity or official academic records. Including such data would increase accuracy.

The results provide clear directions for application in the university context. Promoting regular physical activity among students can improve health, increase energy levels, and support academic performance. Universities can integrate structured fitness programs into the curriculum or offer accessible recreational activities.

The strong relationship between physical activity and reduced stress suggests that exercise can be used as a strategy for stress management. Universities can develop wellness programs that include physical activity, relaxation techniques, and time management training.

The higher stress levels reported by female students indicate the need for targeted interventions. Support services can focus on stress reduction strategies adapted to this group.

Academic staff can also use these findings to encourage active lifestyles as part of student development. Short physical activity sessions, outdoor activities, or sport-based initiatives can be integrated into student life.

These actions can contribute to improving both well-being and academic outcomes, while also supporting long-term healthy behaviors.

Conclusion

The results of this study show that physical activity plays a central role in the lifestyle of students from the Faculty of Physical Education and Mountain Sports. Most participants reported moderate to high levels of activity, which reflects the specific academic profile and supports the idea that this group maintains an active routine.

Physical activity is positively associated with perceived health, energy level, and academic performance. Students who are more active report better health status, higher energy, and improved concentration and academic results. At the same time, physical activity shows a negative relationship with perceived stress, indicating that active students experience lower stress levels.

Stress emerges as a key factor influencing academic performance. Higher stress levels are associated with lower GPA and reduced concentration. Female students report significantly higher stress compared to male students, although no differences appear in physical activity or academic outcomes.

These findings highlight the importance of integrating fitness and wellness strategies into the academic environment. Promoting regular physical activity can support both physical and mental health, while also improving academic performance. Universities can use these results to develop targeted interventions that encourage active lifestyles and reduce stress among students.

Limitations and future directions

The study has several important limitations. The sample included only students from the Faculty of Physical Education and Mountain Sports, which limits the generalization of the results to other groups of students. The participants' profile may explain the high levels of physical activity observed.

The cross-sectional design allows the identification of associations between physical activity, perceived health, stress, and academic performance, but it does not establish causal relationships. The data were collected through self-reported questionnaires, which may involve memory errors or socially influenced responses.

The academic average was also self-reported and was not verified through official documents.

Future research should include larger and more diverse samples, longitudinal studies, and objective measurements, such as accelerometers, fitness tests, official academic data, and standardized psychological scales. It would also be useful to analyze factors such as sleep, nutrition, motivation, social support, and screen time.

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