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# Factors associated with the perception of major barriers to leisure physical activity among university from an institution in Minas Gerais

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# **FACTORS ASSOCIATED WITH THE PERCEPTION OF MAJOR BARRIERS TO LEISURE PHYSICAL ACTIVITY AMONG UNIVERSITY FROM AN INSTITUTION IN MINAS GERAIS**

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## ABSTRACT

Barriers to physical activity (PA) refer to subjective difficulties that may prevent or discourage the adoption of this behavior. The objective was to estimate the prevalence and factors associated with perceived barriers to leisure-time PA among undergraduate students at a university in the state of Minas Gerais. A cross-sectional study was conducted with a sample of 994 participants. The dependent variable was barriers to leisure-time PA. The independent variables considered sociodemographic, university affiliation, biological, behavioral, and perceptive characteristics. The association estimate was performed by calculating the Odds Ratio (OR). The level of statistical significance was set at 5% ( $p < 0.05$ ). The barrier related to personal aspects was the most frequent, with a prevalence of 48%. There was a lower chance of perceiving resource/opportunity barriers among men, and among those with adequate sleep, there was a lower chance of perceiving personal and situational barriers. Undergraduates with a positive perception of health and stress were less likely to perceive barriers. Considering personal factors in intervention strategies may be essential to minimize barriers to leisure-time PA among university students.

**Keywords:** university student, physical exercise, sedentary behaviors.

## Introduction

Sufficient practice of physical activity (PA) is widely recognized as an important determinant of health<sup>1</sup>. In addition to having significant beneficial effects<sup>2</sup>, sufficient practice of PA can help prevent and control the risks of complications associated to chronic non-communicable diseases<sup>3</sup>.

On the other hand, it is noted that the adoption and maintenance of this behavior do not depend only on individual factors, but are also conditioned to a series of external and contextual factors that can act as barriers (limiters) that hinder or discourage the adoption of the practice<sup>4</sup>, especially considering leisure time.

It is observed that both demotivation and time limitation are usually reported as impediments to the practice of PA by adults<sup>5</sup>. Furthermore, in university students, the most expressive barriers are lack of time and motivation, as well as the absence of accessible places<sup>6</sup>.

These barriers are consistently reported more by women, regardless of the type of barrier<sup>7,8</sup>. On the other hand, situational barriers, inherent to the people context (uncomfortable climate, overwork, family and study obligations) are generally associated with older age, lower level of education and in those married<sup>9</sup>. While factors such as body mass index (BMI) and work situation (work or not) are more often related to personal barriers<sup>6</sup>.

On the other hand, regarding university students, there is a lack of information on the identification of the groups most exposed to the distinct types of perceived barriers. Knowing the characteristics associated with the types of barriers to the practice of PA can help in the establishment of actions aimed at promoting the practice of PA in different populations<sup>10</sup>, but especially in university students, a group that has expanded over the years and that presents daily demands for different academic activities aimed at professional training.

To subsidize the development of actions, either through the implementation of extension programs or the approval of institutional policies with an emphasis on the health of this public, the information from this research can contribute to addressing the barriers that hinder active behavior among university students. Thus, this study aimed to estimate the prevalence and factors associated with the types of perceived barriers to the practice of PA in leisure time in university students of a public institution in the state of Minas Gerais.

## Methods

This epidemiological and cross-sectional study is derived from the research "Lifestyle and Quality of Life of students at the Federal University of Triângulo Mineiro (UFTM)". The target population consisted of university students from face-to-face courses, enrolled in the first semester of 2018, at the UFTM campus located in the city of Uberaba, Minas Gerais.

The target population was composed of 5.952 university students. The sample was estimated based on a prevalence of 50%, confidence level of 95% and sampling error of three percentage points. To prevent losses and enable association analyses in adjusted models, 20% and 10%, respectively, were added to the calculated sample. Therefore, the estimated sample comprised 1.195 university students. It was decided to replace the university students who refused to participate. The selection method was by convenience.

The minimum number of university students in each of the twenty-five courses of the institution was estimated, and the proportionality of the university students in each course was respected. All university students enrolled in face-to-face undergraduate courses were included in the study, regardless of physical condition. After tabulating the data, university students under the age of 18, who reported being enrolled in distance learning or technical courses, those who already had a higher education diploma, and those who were linked to courses at the Iturama Campus were excluded, since at that time this campus was in the structuring phase (2015), with a different profile from the Uberaba campus. The exclusion criteria were specified in the Informed Consent Form (ICF).

### *Procedures*

The information was collected through an instrument composed of questions from the questionnaire Indicators of Health and Quality of Life of Academics (ISAQ-A), validated for application in university students<sup>11</sup>, the *International Physical Activity Questionnaire* (IPAQ), short version<sup>12</sup>, as well as sociodemographic questions and questions about the participants link with the University.

For data collection, the responsible team, composed of eleven applicators, was trained in March 2018. These applicants were university students, non-participants in the sample and post-graduate students in Physical Education at UFTM. Data collection took place from April to July 2018. The instrument was applied in classrooms, individually or in groups of up to thirty university students with the presence and assistance of an applicator, taking an average of 15 minutes to complete.

The dependent variable was the barriers to the practice of PA at leisure time, reported as the 1st (Main), in order of importance (Kappa: 0.51)<sup>11</sup>, categorized into personal (tiredness, lack of motor skill, lack of physical conditions and lack of will), situational (unfavorable climate, overwork, study obligations and family obligations)

and resource/opportunity (distance to the place of practice, lack of facilities, lack of money and lack of safety conditions), in addition to the option I have not noticed difficulties<sup>13</sup>.

The independent variables were: gender (male and female), age group (18 to 24 years, 25 years or more), marital status (with partner and without partner), study time (up to 2 years and 3 years or more), areas of study (Health Sciences and other non-health related areas), internship/work situation (does not work/does not do internship and works/does internship), study period (night or day), moderate to vigorous PA (insufficiently active: <150 minutes per week; active: 150 minutes or more per week)<sup>14</sup> and sitting time (up to 9.27 hours / day and 9.28 hours / day or more)<sup>15</sup>, both measured by IPAQ<sup>12</sup>, sleep time (appropriate: 7 to 9 hours / day; and inappropriate: <7 hours / day and above 9 hours / day), BMI, rated up to 24.9 kg / m<sup>2</sup> (without excess body weight) and 25.0 kg / m<sup>2</sup> or more (with excess body weight), health self-assessment (positive: very good and good; and negative: regular, bad and very bad) and negative stress self-assessment (positive: never and rarely stressed; and negative: sometimes, almost always and always stressed).

### *Statistical analysis*

The data were tabulated in Excel software, version 2013, and analyzed in SPSS for Windows, version 25. The exclusion of university students with missing information regarding the outcome of this study (barriers to the practice of PA at leisure time) was conducted to minimize discrepancies in the sample size in each variable used in this study. Absolute and relative frequencies were analyzed, in addition to estimating the mean values (standard deviation), minimum and maximum values. Association estimation was performed via crude and adjusted Odds *Ratio* (OR), using multinomial logistic regression. The adjustment was carried out by the selection method *forward*. Variables with P values < 0.20 in the crude analysis were simultaneously included in the adjusted model. The significance level adopted was 5%.

### *Ethical aspects*

The present study was approved by the Research Ethics Committee of UFTM, under the opinion number 2.402.734. All participants submitted their consent to participate in the research, via ICF, and participants were guaranteed the confidentiality of individual information and the minimization of risks.

## **Results**

A total of 1.156 university students participated in this study. However, three were excluded because they were under 18 years of age and forty-three because they reported having a higher education diploma. The final sample was 1.110 university students. With the exclusion of university students who did not answer the information about the barriers to the practice of PA in leisure, the sample of this study was 994 university students. The description of sociodemographic, university-related, behavioral, biological, and perceptual characteristics is presented in Table 1. There was a greater participation of women, aged 18 to 24 years, without a partner, with up to 2 years of studies, from other areas not related to health, who had no work or internship relationship, and that studied during the day. In the context of health-related behaviors, most university students were classified as active (72.1%). One-third of college students had high sitting time. Overweight occurred in 27.4% of university

students, and negative self-assessment of Health and stress in life were observed in 47.3% and 84.3%, respectively.

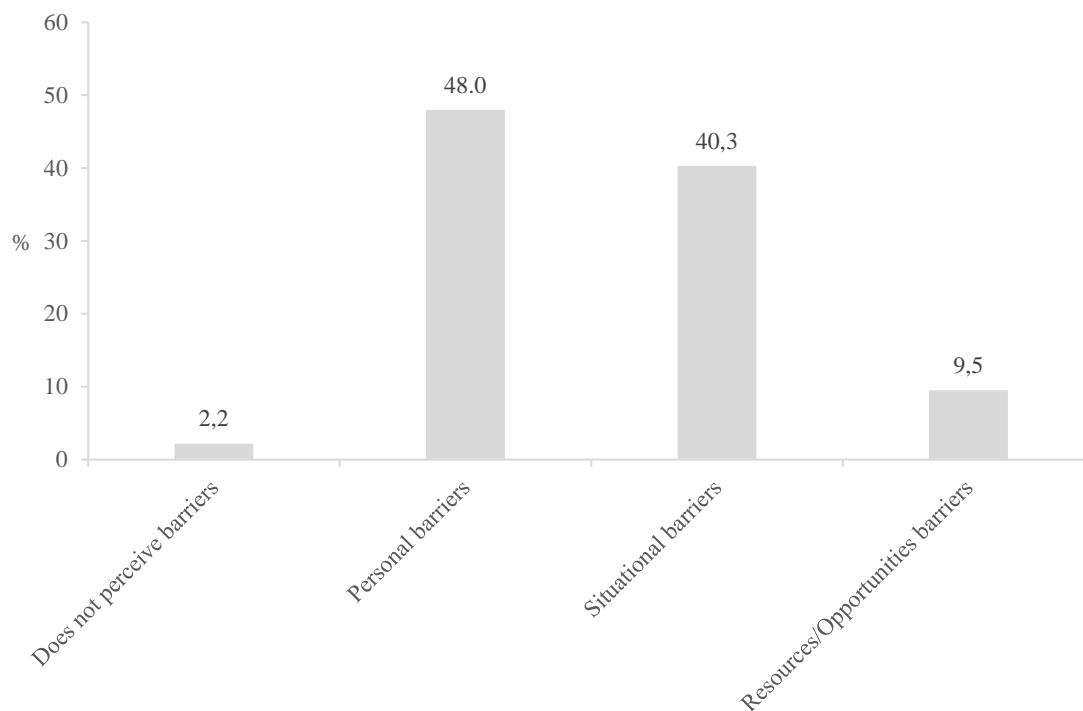
**Table 1** - Distribution of the sample considering sociodemographic, university-related, behavioral, biological, and perceptual variables in university students from Uberaba, MG. 2018.

Variable	n	%
<b>Gender</b>		
Male	388	39.2
Female	602	60.8
<b>Age group</b>		
18 to 24 years	882	88.7
25 years or older	112	11.3
<b>Marital Status</b>		
With partner	40	4.0
Without partner	954	96.0
<b>Study time</b>		
Up to 2 years	498	50.3
3 years or older	493	49.7
<b>Study area</b>		
Other non-health related areas	695	69.9
Health Sciences	299	30.1
<b>Work/internship situation</b>		
No work / no internship	849	85.4
Work/internships	145	14.6
<b>Study period</b>		
Night	259	26.1
Day	734	73.9
<b>MVPA</b>		
Insufficiently active	274	27.9
Active	708	72.1
<b>Sleep*</b>		
Appropriate	483	49.8
Inappropriate	487	50.2
<b>Sitting Time</b>		
Up to 9.27 hours / day	597	60.4
9.28 hours / day or more	391	39.6
<b>BMI</b>		
No excess weight	714	72.6
Overweight	270	27.4
<b>Self-assessment of Health</b>		
Positive	523	52.7
Negative	469	47.3
<b>Stress self-assessment</b>		
Positive	156	15.7
Negative	837	84.3

**Note:** MVPA: moderate to vigorous physical activity; BMI: body mass index; \* variable with the highest number of missed observations (n = 24)

**Source:** The authors

The prevalence of barriers to the practice of PA at leisure is shown in Figure 1. The personal barrier was the most prevalent (48%) among university students, followed by situational barriers. Resource/opportunity barriers were less prevalent.



**Figure 1** - Prevalence of barriers to the practice of PA at leisure time in university students. Uberaba, MG. 2018.  
 Source: **The authors**

The prevalence of barriers to the practice of PA at leisure according to exploratory characteristics among university students is presented in Table 2. It was observed that the barriers of personal and situational aspect showed predominance among the different sociodemographic, biological, link with the University, and perceptual characteristics of the university students.

**Table 2** - Prevalence of barriers to the practice of physical activities in leisure according to exploratory characteristics in university students. Uberaba, MG. 2018.

Variable	Does not perceive barriers	Personal	Situational	Resources/ Opportunities
	n (%)	n (%)	n (%)	n (%)
<b>Gender</b>				
Male	17 (4.4)	188 (48.4)	156 (40.2)	27 (7.0)
Female	5 (0.8)	287 (47.7)	243 (40.4)	67 (11.1)
<b>Age group</b>				
18 to 24 years	18 (2.0)	427 (48.4)	356 (40.4)	81 (9.2)
25 years or older	4 (3.6)	50 (44.6)	45 (40.2)	13 (11.6)
<b>Marital Status</b>				
With partner	-	26 (65.0)	10 (25.0)	4 (10.0)
Without partner	22 (2.3)	451 (47.3)	391 (41.0)	90 (9.4)
<b>Study time</b>				
Up to 2 years	7 (1.4)	242 (48.6)	201 (40.4)	48 (9.6)
3 years or older	15 (3.0)	233 (47.3)	199 (40.4)	46 (9.3)
<b>Study area</b>				
Other non-health related areas	15 (2.2)	340 (48.9)	276 (39.7)	64 (9.2)
Health Sciences	7 (2.3)	137 (45.9)	125 (41.8)	30 (10.0)
<b>Work/internship situation</b>				
No work / no internship	15 (1.8)	406 (47.8)	341 (40.2)	87 (10.2)
Work/internships	7 (4.8)	71 (49.0)	60 (41.4)	7 (4.8)
<b>Study period</b>				
Night	5 (1.9)	128 (49.4)	96 (37.1)	30 (11.6)
Day	17 (2.3)	348 (47.4)	305 (41.6)	64 (8.7)
<b>MVPA</b>				
Insufficiently active	2 (0.7)	144 (52.5)	101 (36.9)	27 (9.9)
Active	20 (2.8)	323 (45.6)	298 (42.1)	67 (9.5)
<b>Sleep</b>				
Appropriate	17 (3.5)	218 (45.1)	194 (40.2)	54 (11.2)
Inappropriate	4 (0.8)	251 (51.6)	195 (40.0)	37 (7.6)
<b>Sitting Time</b>				
Up to 9.27 hours / day	18 (3.0)	289 (48.4)	233 (39.0)	57 (9.5)
9.28 hours / day or more	4 (1.0)	185 (47.3)	165 (42.2)	37 (9.5)
<b>BMI</b>				
No excess weight	17 (2.4)	312 (43.7)	313 (43.8)	72 (10.1)
Overweight	5 (1.9)	159 (58.9)	84 (31.1)	22 (8.1)
<b>Self-assessment of Health</b>				
Positive	20 (3.8)	237 (45.4)	222 (42.4)	44 (8.4)
Negative	2 (0.4)	240 (51.2)	179 (38.2)	48 (10.2)
<b>Stress self-assessment</b>				
Positive	11 (7.1)	76 (48.6)	60 (38.5)	9 (5.8)
Negative	11 (1.3)	401 (48.0)	341 (40.7)	84 (10.0)

**Note:** %: Prevalence; MVPA: moderate to vigorous physical activity; BMI: Body Mass Index.

**Source:** The authors

Table 3 shows the gross associations between exploratory characteristics and barriers to the practice of PA at leisure. Men, those who reported sitting time less than 9.28 hours/day, and who positively evaluated both their health and stress levels in their lives, were less likely to perceive any of the options of barriers to the practice of PA at leisure. On the other hand, university students who did not work/did not do an internship were more likely to perceive all barriers. Insufficiently active university students were 4.46 times more likely (95% CI: 1.03-19.3) to perceive personal barriers as the main factor.

**Table 3** - Crude analysis of the association between exploratory characteristics and barriers to the practice of leisure-time physical activities in university students. Uberaba, MG. 2018.

Variables	Crude analysis		
	Personal	Situational	Resources/ opportunities
	OR (95% CI)	OR (95% CI)	OR (95% CI)
<b>Gender</b>			
Male	<b>0.19 (0.07-0.53)</b>	<b>0.19 (0.07-0.52)</b>	<b>0.12 (0.04-0.35)</b>
Female	1.00	1.00	1.00
<b>Age group</b>			
18 to 24 years	1.90 (0.62-5.83)	1.76 (0.57-5.42)	1.38 (0.40-4.74)
25 years or older	1.00	1.00	1.00
<b>Study time</b>			
Up to 2 years	2.23 (0.89-5.56)	2.16 (0.86-5.42)	2.24 (0.84-5.98)
3 years or older	1.00	1.00	1.00
<b>Study area</b>			
Other non-health related areas	1.16 (0.46-2.90)	1.03 (0.41-2.59)	1.00 (0.37-2.70)
Health sciences	1.00	1.00	1.00
<b>Work/internship situation</b>			
No work / no internship	<b>2.67 (1.05-6.78)</b>	<b>2.65 (1.04-6.78)</b>	<b>5.80 (1.78-18.9)</b>
Work/internships	1.00	1.00	1.00
<b>Study period</b>			
Night	1.25 (0.45-3.46)	1.07 (0.38-2.98)	1.59 (0.54-4.73)
Day	1.00	1.00	1.00
<b>MVPA</b>			
Insufficiently active	<b>4.46 (1.03-19.3)</b>	3.39 (0.78-14.7)	4.03 (0.88-18.4)
Active	1.00	1.00	1.00
<b>Sleep</b>			
Appropriate	<b>0.20 (0.07-0.62)</b>	<b>0.23 (0.08-0.71)</b>	0.34 (0.11-1.10)
Inappropriate	1.00	1.00	1.00
<b>Sitting Time</b>			
Up to 9.27 hours / day	0.35 (0.12-1.04)	<b>0.31 (0.10-0.94)</b>	0.34 (0.11-1.09)
9.28 hours / day or more	1.00	1.00	1.00
<b>BMI</b>			
No excess weight	0.58 (0.21-1.59)	1.10 (0.39-3.06)	0.96 (0.32-2.91)
Overweight	1.00	1.00	1.00
<b>Self-assessment of Health</b>			
Positive	<b>0.10 (0.02-0.43)</b>	<b>0.12 (0.03-0.54)</b>	<b>0.09 (0.02-0.41)</b>
Negative	1.00	1.00	1.00
<b>Stress self-assessment</b>			
Positive	<b>0.19 (0.08-0.45)</b>	<b>0.18 (0.07-0.42)</b>	<b>0.11 (0.04-0.32)</b>
Negative	1.00	1.00	1.00

**Note:** OR: Odds Ratio; 95% CI: 95% confidence interval; MVPA: moderate to vigorous physical activity; BMI: body mass index. Reference category: has no perceived barriers.

**Source:** The authors

Table 4 shows the adjusted associations between exploratory characteristics and barriers to the practice of PA at leisure. Men were less likely (OR: 0.22; 95% CI: 0.07-0.72) to perceive resource/opportunity barriers. College students who reported adequate sleep were less likely to perceive personal and situational barriers. In addition, those who self-assessed health and stress level in life as positive, were less likely to perceive all barriers.

**Table 4** - Adjusted analysis of the association between exploratory characteristics and barriers to the practice of physical activities in leisure in university students. Uberaba, MG. 2018.

Variables	Adjusted analysis		
	Personal OR (95% CI)	Situational OR (95% CI)	Resources/ opportunities OR (95% CI)
<b>Gender</b>			
Male	0.37 (0.13-1.12)	0.39 (0.13-1.17)	<b>0.22 (0.07-0.72)</b>
Female	1.00	1.00	1.00
<b>Work/internship situation</b>			
No work / no internship	<b>3.57 (1.23-10.4)</b>	<b>3.06 (1.05-8.90)</b>	<b>5.88 (1.61-21.5)</b>
Work/internships	1.00	1.00	1.00
<b>MVPA</b>			
Insufficiently active	3.20 (0.69-14.8)	2.47 (0.53-11.5)	2.91 (0.59-14.2)
Active	1.00	1.00	1.00
<b>Sleep</b>			
Appropriate	<b>0.23 (0.07-0.74)</b>	<b>0.26 (0.08-0.82)</b>	0.39 (0.11-1.35)
Inappropriate	1.00	1.00	1.00
<b>Sitting Time</b>			
Up to 9.27 hours / day	0.38 (0.11-1.38)	0.34 (0.09-1.24)	0.37 (0.10-1.42)
9.28 hours / day or more	1.00	1.00	1.00
<b>BMI</b>			
No excess weight	0.61 (0.20-1.89)	1.13 (0.36-3.52)	0.99 (0.29-3.38)
Overweight	1.00	1.00	1.00
<b>Self-assessment of Health</b>			
Positive	<b>0.08 (0.01-0.62)</b>	<b>0.09 (0.01-0.73)</b>	<b>0.07 (0.01-0.57)</b>
Negative	1.00	1.00	1.00
<b>Stress self-assessment</b>			
Positive	<b>0.34 (0.13-0.90)</b>	<b>0.28 (0.11-0.75)</b>	<b>0.23 (0.07-0.75)</b>
Negative	1.00	1.00	1.00

**Note:** OR: Odds Ratio; 95% CI: 95% confidence interval; MVPA: moderate to vigorous physical activity; BMI: body mass index. Reference category: has no perceived barriers.

**Source:** The authors

## Discussion

The results indicated that personal barriers were the most prevalent among university students, followed by situational barriers and, finally, barriers related to resources and/or opportunities. There were lower chances of perception of resource and/or opportunity barriers among male students. Similarly, students who reported adequate sleep had lower perceptions of personal and situational barriers. Those who considered stress as positive and who self-assessed their health as positive showed lower chances of perceiving any type of barrier. In contrast, university students who did not work or did not have an internship were more likely to perceive all the barriers investigated.

The perception of the personal barriers was the biggest limiting factor to the practice of PA at leisure reported by the university students in this study. This result converges with research developed with university students from Canada, in which presented as the main barrier intrapersonal factors, involving stress, lack of interest, fatigue and motor skill<sup>16</sup>. In the study by Rosselli et al.<sup>17</sup> with young people in Florence, Italy, it was observed a higher prevalence for the report of lack of energy for exercise and lack of will.

However, this study differs from others, like the study conducted at the University of Khartoum in Sudan, where lack of time was more prevalent (43.8%)<sup>18</sup>. It

is noted that the lack of time represents one of the greatest difficulties reported by university students<sup>19,20</sup>. On the other hand, the personal factors that limit the practice may be related not only to the type of daily activity, but, due to other characteristics that may impact on the personal context for the regular practice of PA, such as the time spent in long periods of study in the sitting position, which may favor stress and fatigue, and thus contribute to the unwillingness to practice PA.<sup>21</sup>

Studies with Brazilian university students showed divergent results from this study, since the situational barrier was observed with higher prevalence and the main reasons were the high study hours, extensive work, and family commitments<sup>22</sup> stress, unfavorable climate, overwork, family, and study obligations<sup>13</sup>. The differences between the studies can be attributed to the specific characteristics of each region, especially considering the socio-cultural and economic context of each sample. However, despite the prevalence of personal barriers in this study, situational barriers were the second most prevalent, which approximates the pattern observed in the Brazilian national context.

It is noteworthy that male university students were less likely to perceive barriers related to resources and/or opportunities. This finding diverges from research with university students from the state of Ceará, northeast region of Brazil, where there was an association of this group with the situational barriers related to extensive study and work hours<sup>23</sup>. Thus, it is believed that among university men there is a lower identification of these barriers, characterized as resources/opportunities (distance to the place of practice, lack of facilities, lack of money to pay tuition or professional, lack of security conditions) in the adoption of practices. This may reflect a greater perception of the ability to perform PA at leisure in different conditions, as well as a greater social profile favoring this group for regular adoption of this behavior compared to women.

There was an association with higher chances of perceiving situational, personal and resource/opportunity barriers for university students who reported not having any type of job/internship. It is important to characterize the increase in the number of university students in public universities of economic classes C, D and E<sup>24</sup>, and not having an income to supplement expenses represents a limitation for various activities, since these students prioritize food, transportation and study materials, leaving leisure expenses in the background<sup>25</sup>, therefore, it is understood that economic factors can influence the practice of PA in leisure time of university students and consequently impact on their health levels and academic performance.

Among the health-related behaviors, it was observed that students who reported adequate sleep presented lower chances of perception of personal and situational barriers. Sleep is part of the lifestyle and is related to the regular practice of PA<sup>26</sup>, in addition to other characteristics such as stress, anxiety and depression<sup>27</sup>. The findings of this study indicate that the minimum recommended amount of sleep can minimize the possible limitations of healthy habits, which reinforces the need for daily maintenance of this behavior, even in a period of life of many academic requirements, such as studies, academic work, and evaluation activities.

Other interesting findings of this study were the associations with lower chances of perception of all barriers in university students who self-assessed their health as positive, and for those who perceived stress level in life as positive. In this context, feeling satisfied with health and stress level favors a lower perception of barriers to PA practice<sup>28</sup>. It is inferred that those who self-assess health and stress levels, both positively, are more likely to practice PA and thus perceive fewer difficulties that prevent the adoption of this habit<sup>29,30</sup>.

This study has some limitations such as convenience sampling, which may favor selection bias. However, the sample was stratified among the courses, thus avoiding the massive participation of university students from only a few courses. The use of a questionnaire may contribute to response bias, however, the measures used have satisfactory minimum values of validity and reproducibility<sup>11</sup>. Among the positive characteristics, the sample size, and the inclusion of all undergraduate courses of the institution in the research stand out, which provides a comprehensive view of the profile of university students. The results of this study reinforce the need for broad institutional policies that value health in a holistic way, minimizing risks of stress and demands that contribute to impacts on the PA routine in the leisure time of university students.

## Conclusions

It is concluded that the main barriers to the practice of PA in leisure perceived by university students were personal, followed by situational and resources/opportunities. Men were less likely to perceive resource/opportunity barriers. Assessing health and stress levels as positive, and reporting adequate daily sleep routine, were associated with lower chances of perceiving barriers. On the other hand, greater chances of perceiving all barriers were observed for those that did not work or do internships.

## References

1. World Health Organization. Global action plan on physical activity 2018–2030: more active people for a healthier world [Internet]. 2018 [citado 7 de julho de 2025]. Available from: <https://www.who.int/publications/i/item/9789241514187>
2. Warburton DER, Bredin SSD. Health benefits of physical activity: a systematic review of current systematic reviews. *Current Opinion in Cardiology* [Internet]. 2017 Sep; 32(5):541–56. DOI: <https://doi.org/10.1097/HCO.0000000000000437>
3. Koorts H, Ma J, Swain CTV, Rutter H, Salmon J, Bolton KA. Systems approaches to scaling up: a systematic review and narrative synthesis of evidence for physical activity and other behavioural non-communicable disease risk factors. *Int J Behav Nutr Phys Act* [Internet]. 2024 Dec 1; 21(1). DOI: <https://doi.org/10.1186/s12966-024-01579-6>
4. Koh YS, Asharani PV, Devi F, Roystonn K, Wang P, Vaingankar JA, et al. A cross-sectional study on the perceived barriers to physical activity and their associations with domain-specific physical activity and sedentary behaviour. *BMC Public Health* [Internet]. 2022 Dec 1; 22(1):1–11. DOI: <https://doi.org/10.1186/s12889-022-13431-2>
5. Rech CR, de Camargo EM, de Araujo PAB, Loch MR, Reis RS. Perceived barriers to leisure-time physical activity in the Brazilian population. *Rev Bras Med Esporte* [Internet]. 2018 Jul 1; 24(4):303–9. DOI: <https://doi.org/10.1590/1517-869220182404175052>
6. Silva RMF, Mendonça CR, Azevedo VD, Memon AR, Silva Noll PRE, Noll M. Barriers to high school and university students' physical activity: a systematic review. *PLoS One* [Internet]. 2022 Apr 1; 17(4). DOI: <https://doi.org/10.1371/journal.pone.0265913>
7. De Sousa ASA, Correia MA, Farah BQ, Saes G, Zerati AE, Puech-Leao P, et al. Barriers and levels of physical activity in patients with symptomatic peripheral artery disease: comparison between women and men. *J Aging Phys Act* [Internet]. 2019; 27(5):719–24. DOI: <https://doi.org/10.1123/japa.2018-0206>
8. Herazo-Beltrán Y, Pinillos Y, Vidarte J, Crissien E, Suarez D, García R. Predictors of perceived barriers to physical activity in the general adult population: a cross-sectional study. *Braz J Phys Ther* [Internet]. 2017 Jan 1; 21(1):44–50. DOI: <https://doi.org/10.1016/j.bjpt.2016.04.003>
9. Chaabane S, Chaabna K, Doraiswamy S, Mamtani R, Cheema S. Barriers and facilitators associated with physical activity in the Middle East and North Africa region: a systematic

- overview. *Int J Environ Res Public Health* [Internet]. 2021 Feb 2; 18(4):1–21. DOI: <https://doi.org/10.3390/ijerph18041647>
10. Silva MPD, Fontana F, Campos JG, Mazzardo O, Lima DF, Paludo AC, Campos W. Time trends of physical inactivity in Brazilian adults from 2009 to 2017. *Rev Assoc Med Bras* (1992). 2021 Jun; 67(5):681–689. DOI: <https://doi.org/10.1590/1806-9282.20201077>
  11. de Sousa TF, Fonseca SA, José HPM, Nahas MV. Validade e reprodutibilidade do questionário Indicadores de Saúde e Qualidade de Vida de Acadêmicos (Isaq-A). *Arq Cien Esp* [Internet]. 2013; 1(1):21–30. Available from: <https://seer.uftm.edu.br/revistaeletronica/index.php/aces/article/view/254>
  12. Matsudo S, Araújo T, Marsudo V, Andrade D, Andrade E, Oliveira Luis C, et al. Questionário internacional de atividade física (IPAQ): estudo de validade e reprodutibilidade no Brasil. *Rev Bras Ativ Fís Saúde* [Internet]. 2001;;5–18. Available from: <http://periodicos.ufpel.edu.br/ojs2/index.php/RBAFS/article/viewFile/931/1222>
  13. de Sousa TF, Fonseca SA, Barbosa AR. Perceived barriers by university students in relation to leisure-time physical activity. *Rev Bras Cineantropom Desempenho Hum* [Internet]. 2013; 15(2):164–73. DOI: <https://doi.org/10.5007/1980-0037.2013v15n2p164>
  14. Ferreira MS, Sousa TF, Brandão AC, Barros GR, Farias GS, Santos AJ, et al. Should the time of vigorous physical activity be multiplied by two in classifying of practice by IPAQ-short version? *Cenas Educacionais* [Internet]. 2025 Mar 2; 8:e20376. DOI: <https://doi.org/10.5281/zenodo.14956752>
  15. Sousa TF, Santos AJ, Barros GR. Classificação de risco à saúde pelo tempo sentado em universitários brasileiros. *Revista Eletrônica Interdisciplinar* [Internet]. 2024 Jul 2 [cited 2025 Jul 8]; 16(2). Available from: <http://revista.univar.edu.br/rei/article/view/497>
  16. Thomas AM, Beaudry KM, Gammage KL, Klentrou P, Josse AR. Physical activity, sport participation, and perceived barriers to engagement in first-year Canadian university students. *J Phys Act Health* [Internet]. 2019; 16(6):437–46. DOI: <https://doi.org/10.1123/jpah.2018-0198>
  17. Rosselli M, Ermini E, Tosi B, Boddi M, Stefani L, Toncelli L, et al. Gender differences in barriers to physical activity among adolescents. *Nutr Metab Cardiovasc Dis*. 2020 Aug 28; 30(9):1582–9. DOI: <https://doi.org/10.1016/j.numecd.2020.05.005>
  18. Fadul MH, Fadul A, Yasir HEA, Mohamed Elhassan AZW, Manhal GAA, Abdelgafour RH. Physical activity among medical students at the University of Khartoum, Sudan, 2022: knowledge, practice, and barriers. *Cureus* [Internet]. 2023 Sep 25; 15(9). DOI: <https://doi.org/10.7759/cureus.45914>
  19. Griffiths K, Moore R, Brunton J. Sport and physical activity habits, behaviours and barriers to participation in university students: an exploration by socio-economic group. *Sport Educ Soc* [Internet]. 2022 Mar 24; 27(3):332–46. DOI: <https://doi.org/10.1080/13573322.2020.1837766>
  20. Alkhateeb SA, Alkhameesi NF, Lamfon GN, Khawandanh SZ, Kurdi LK, Faran MY, et al. Pattern of physical exercise practice among university students in the Kingdom of Saudi Arabia (before beginning and during college): a cross-sectional study. *BMC Public Health* [Internet]. 2019 Dec 21; 19(1).DOI: <https://doi.org/10.1186/s12889-019-8093-2>
  21. Ikenna UC, Nwobodo LN, Ezeukwu AO Ilo IJ, Ede SS, Okemuo AJ, et al. Relationship between the development of musculoskeletal disorders, physical activity level, and academic stress among undergraduate students of University of Nigeria. *J Educ Health Promot* [Internet]. 2022;11(1). DOI: [https://doi.org/10.4103/jehp.jehp\\_416\\_22](https://doi.org/10.4103/jehp.jehp_416_22)
  22. Pinto A, Claumann G, Cordeiro P, Felden E, Pelegrini A. Barreiras percebidas para a prática de atividade física entre universitários de Educação Física. *Rev Bras Ativ Fís Saúde* [Internet]. 2017;22(1):66–75. DOI: <https://doi.org/10.12820/rbafs.v.22n1p66-75>
  23. Nascimento T, Alves F, Souza E. Barreiras percebidas para a prática de atividade física em universitários da área da saúde de uma instituição de ensino superior da cidade de Fortaleza, Brasil. *Rev Bras Ativ Fís Saúde* [Internet]. 2017; 22(2):137–46. DOI: <https://doi.org/10.12820/rbafs.v.22n2p137-146>
  24. Cureau FV, Duarte PM, Teixeira FS. Simultaneidade de comportamentos de risco para doenças crônicas não transmissíveis em universitários de baixa renda de uma cidade do Sul do Brasil. *Cad Saúde Colet* (Rio J) [Internet]. 2019; 27(3):316–24. DOI: <https://doi.org/10.1590/1414-462X201900030178>

25. de Alencar Abreu MK, Ximenes VM. Pobreza, permanência de universitários e assistência estudantil: uma análise psicossocial. *Psicologia USP* [Internet]. 2021 Nov 8; 32:e200067–e200067. DOI: <https://doi.org/10.1590/0103-6564e200067>
26. Ghrouz AK, Noohu MM, Dilshad Manzar M, Warren Spence D, BaHammam AS, Pandi-Perumal SR. Physical activity and sleep quality in relation to mental health among college students. *Sleep Breath* [Internet]. 2019; 23(2):627–34. DOI: <https://doi.org/10.1007/s11325-019-01780-z>
27. Fattering S, De Beukelaar TT, Ruddy KL, Volk C, Heyse NC, Herbst JA, et al. Deep sleep maintains learning efficiency of the human brain. *Nat Commun* [Internet]. 2017; 8. DOI: <https://doi.org/10.1038/ncomms15405>
28. Anjali, Sabharwal M. Perceived barriers of young adults for participation in physical activity. *Curr Res Nutr Food Sci*. 2018 Aug 1; 6(2):437–49. DOI: <https://dx.doi.org/10.12944/CRNFSJ.6.2.18>
29. Alahmar U, Murra MS, Menegassi B, Spexoto MCB. Fatores associados ao estresse percebido em universitários. *Rev Bras Obes Nutr Emagrecimento* [Internet]. 2020; 14(85):330–9. Available from: <https://doaj.org/article/70d401ebf2474da5aa7ef3237ffb03c5>
30. Andrade GF, Loch MR, Silva AMR. Mudanças de comportamentos relacionados à saúde como preditores de mudanças na autopercepção de saúde: estudo longitudinal (2011–2015). *Cad Saúde Pública* [Internet]. 2019; 35(4). DOI: <https://doi.org/10.1590/0102-311X00151418>

### **CRedit author's contribution statement**

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### **Conflict of Interest Statement**

The authors declare no conflict of interest.

### **Research Data Availability Statement**

The entire data set supporting the results of this study was published in the article itself.

This preprint was submitted under the following conditions:

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