Original Article

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

FATORES ASSOCIADOS À PERCEPÇÃO DAS PRINCIPAIS BARREIRAS PARA A PRÁTICA DE ATIVIDADE FÍSICA NO LAZER DE UNIVERSITÁRIOS DE UMA INSTITUIÇÃO DE 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.

RESUMO

As barreiras para a prática de atividade física (AF) referem-se às dificuldades subjetivas que podem impedir ou desencorajar a adoção desse comportamento. O objetivo foi estimar a prevalência e os fatores associados às barreiras percebidas para a prática de AF no lazer em universitários de uma universidade do estado de Minas Gerais. Realizou-se um estudo transversal com uma amostra composta por 994 participantes. A variável dependente foram as barreiras para AF no lazer. As variáveis independentes consideraram as características sociodemográficas, de vínculo com a universidade, biológica, comportamentais e perceptivas. A estimativa de associação foi realizada via cálculo do *Odds Ratio* (OR). O nível de significância estatística foi fixado em 5% ($p<0,05$). A barreira relacionada aos aspectos pessoais foi a mais frequente, com uma prevalência de 48%. Observou-se menores chances de perceber as barreiras dos recursos/oportunidades entre os homens e entre aqueles com sono apropriado, houve menores chances de percepção das barreiras pessoais e situacionais. Os universitários com percepção positiva de saúde e do estresse apresentaram menores chances de perceber barreiras. Considerar os fatores pessoais nas estratégias de intervenções pode ser fundamental para minimizar as barreiras à prática de AF no lazer entre estudantes universitários.

Palavras-chave: estudante universitário, exercício físico, comportamentos sedentários.

Introduction

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

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[4], 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[5]. Furthermore, in university students, the most expressive barriers are lack of time and motivation, as well as the absence of accessible places[6].

These barriers are consistently reported more by women, regardless of the type of barrier[7,8]. 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[9]. While factors such as body mass index (BMI) and work situation (work or not) are more often related to personal barriers[6].

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[10], 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[11], the *International Physical Activity Questionnaire* (IPAQ), short version[12], 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)[11], 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[13].

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)[14] and sitting time (up to 9.27 hours / day and 9.28 hours / day or more)[15], both measured by IPAQ[12], 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^2 (without excess body weight) and 25.0 kg / m^2 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	%
Gender		
Male	388	39.2
Female	602	60.8
Age group		
18 to 24 years	882	88.7
25 years or older	112	11.3
Marital Status		
With partner	40	4.0
Without partner	954	96.0
Study time		
Up to 2 years	498	50.3
3 years or older	493	49.7
Study area		
Other non-health related areas	695	69.9
Health Sciences	299	30.1
Work/internship situation		
No work / no internship	849	85.4
Work/internships	145	14.6
Study period		
Night	259	26.1
Day	734	73.9
MVPA		
Insufficiently active	274	27.9
Active	708	72.1
Sleep*		
Appropriate	483	49.8
Inappropriate	487	50.2
Sitting Time		
Up to 9.27 hours / day	597	60.4
9.28 hours / day or more	391	39.6
BMI		
No excess weight	714	72.6
Overweight	270	27.4
Self-assessment of Health		
Positive	523	52.7
Negative	469	47.3
Stress self-assessment		
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.
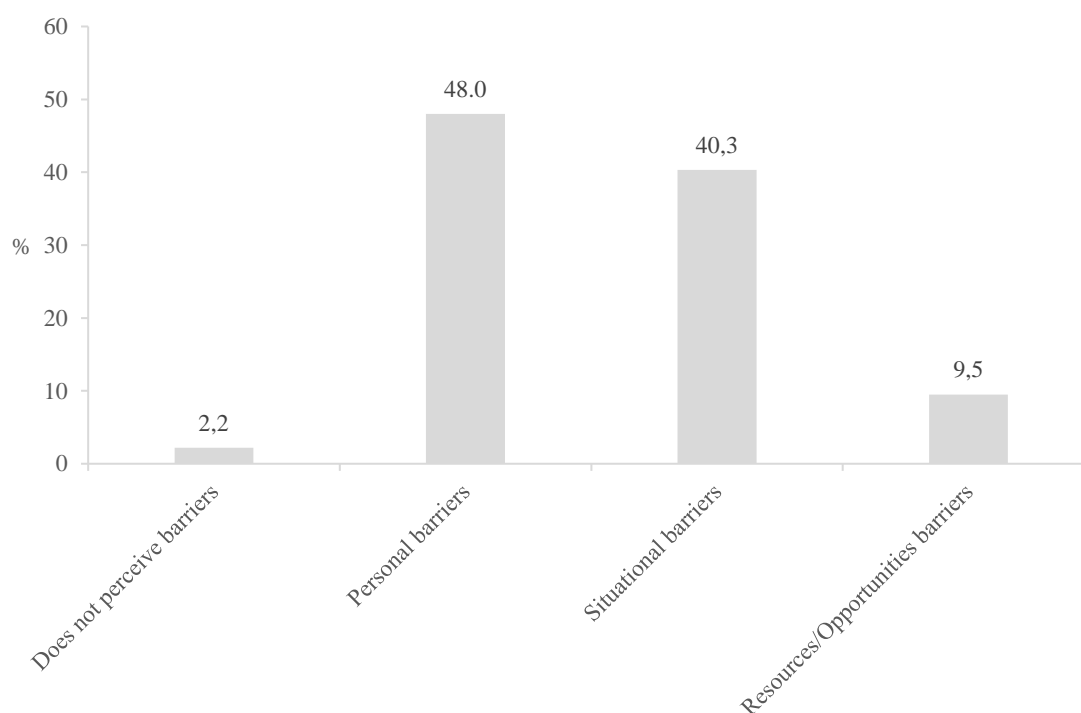

Figure 1 - Prevalence of barriers to the practice of PA at leisure time in university students. Uberaba, MG. 2018.
Source: The authors

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 (%)
Gender				
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)
Age group				
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)
Marital Status				
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)
Study time				
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)
Study area				
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)
Work/internship situation				
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)
Study period				
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)
MVPA				
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)
Sleep				
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)
Sitting Time				
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)
BMI				
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)
Self-assessment of Health				
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)
Stress self-assessment				
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)**
Gender			
Male	**0.19 (0.07-0.53)**	**0.19 (0.07-0.52)**	**0.12 (0.04-0.35)**
Female	1.00	1.00	1.00
Age group			
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
Study time			
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
Study area			
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
Work/internship situation			
No work / no internship	**2.67 (1.05-6.78)**	**2.65 (1.04-6.78)**	**5.80 (1.78-18.9)**
Work/internships	1.00	1.00	1.00
Study period			
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
MVPA			
Insufficiently active	**4.46 (1.03-19.3)**	3.39 (0.78-14.7)	4.03 (0.88-18.4)
Active	1.00	1.00	1.00
Sleep			
Appropriate	**0.20 (0.07-0.62)**	**0.23 (0.08-0.71)**	0.34 (0.11-1.10)
Inappropriate	1.00	1.00	1.00
Sitting Time			
Up to 9.27 hours / day	0.35 (0.12-1.04)	**0.31 (0.10-0.94)**	0.34 (0.11-1.09)
9.28 hours / day or more	1.00	1.00	1.00
BMI			
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
Self-assessment of Health			
Positive	**0.10 (0.02-0.43)**	**0.12 (0.03-0.54)**	**0.09 (0.02-0.41)**
Negative	1.00	1.00	1.00
Stress self-assessment			
Positive	**0.19 (0.08-0.45)**	**0.18 (0.07-0.42)**	**0.11 (0.04-0.32)**
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	**Situational**	**Resources/ opportunities**
	OR (95% CI)	**OR (95% CI)**	**OR (95% CI)**
Gender			
Male	0.37 (0.13-1.12)	0.39 (0.13-1.17)	**0.22 (0.07-0.72)**
Female	1.00	1.00	1.00
Work/internship situation			
No work / no internship	**3.57 (1.23-10.4)**	**3.06 (1.05-8.90)**	**5.88 (1.61-21.5)**
Work/internships	1.00	1.00	1.00
MVPA			
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
Sleep			
Appropriate	**0.23 (0.07-0.74)**	**0.26 (0.08-0.82)**	0.39 (0.11-1.35)
Inappropriate	1.00	1.00	1.00
Sitting Time			
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
BMI			
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
Self-assessment of Health			
Positive	**0.08 (0.01-0.62)**	**0.09 (0.01-0.73)**	**0.07 (0.01-0.57)**
Negative	1.00	1.00	1.00
Stress self-assessment			
Positive	**0.34 (0.13-0.90)**	**0.28 (0.11-0.75)**	**0.23 (0.07-0.75)**
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[16]. In the

study by Rosselli et al.[17] 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%)[18]. It is noted that the lack of time represents one of the greatest difficulties reported by university students[19,20]. 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.[21].

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[22] stress, unfavorable climate, overwork, family, and study obligations[13]. 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, were there was an association of this group with the situational barriers related to extensive study and work hours[23]. 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[24], 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[25], 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[26], in addition to other characteristics such as stress, anxiety and depression[27]. 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[28]. 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[29,30].

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[11]. 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.

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