Physical activity and sedentary behavior in medical students at a Peruvian public university

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Citation Janampa-Apaza A, Pérez-Mori T, Benites-Yshpilco L, Meza K, Santos-Paucar J, Perez-Mendez R, et al. Physical activity and sedentary behavior in medical students at a Peruvian public university. *Medwave* 2021;21(05):e8210

Doi 10.5867/medwave.2021.05.8210

Submission date 25/11/2020
Submission date 29/03/2021
Publication date 25/06/2021

Origin Not commissioned

Type of review Externally peer-reviewed by four reviewers, double-blind

Keywords exercise, students, medical, sedentary behavior, obesity

Abstract

Introduction

Studies show a high prevalence of physical inactivity and sedentary behavior among university students. However, the relationship between physical activity and sedentary behavior in medical students is unknown.

Objectives

To determine the prevalence of physical activity, sedentary behavior, and related factors among medical students at a public university.

Methods

We conducted an analytical cross-sectional study that included students from the first to the sixth year of medical school. We used the International Physical Activity Questionnaire (IPAQ). We analyzed study variables using Poisson regression, estimating crude and adjusted prevalence ratios.

Results

The final sample consisted of 513 students, of which 35% of women and 30.1% of all pre-clinical students had a low level of physical activity. Male sex and 20 to 24 age group were associated with a lower prevalence of low level of physical activity. Sedentary behavior was 60.9% among students under 20 years old and 55.5% among pre-clinical students. A lower prevalence of sedentary behavior was found in students over 25 years old, clinical students, and those with high levels of physical activity.

Conclusion

The final sample consisted of 513 students, of which 35% of women and 30.1% of all pre-clinical students had a low level of physical activity. Male sex and 20 to 24 age group were associated with a lower prevalence of low level of physical activity. Sedentary behavior was 60.9% among students under 20 years old and 55.5% among pre-clinical students. A lower prevalence of sedentary behavior was found in students over 25 years old, clinical students, and those with high levels of physical activity.

Main messages

- Physical inactivity and sedentary behavior are modifiable risk factors for cardiovascular and metabolic diseases. The incidence of these factors is rising among younger populations.
- This is one of the first studies to address both physical inactivity and sedentary behavior in first to sixth-year medical students in Peru.
- The study's main limitation is the impossibility of establishing a causal relationship due to its cross-sectional design.

Introduction

In addition to a greater presence of behavioral risk factors, such as tobacco or unhealthy diets, an increase in physical inactivity has been observed in young adults[1]. Worldwide, it is estimated that 31% of people over 15 years of age do not meet the minimum physical activity recommended by the World Health Organization[2]. Thus, low levels of physical activity have great relevance in public health because it represents the main modifiable risk factor among adolescents and young adults to prevent future onset of multiple chronic diseases[3].

As part of the young adult population, university students are a group of interest because they present a higher prevalence of overweight and obesity compared to the general population[4]. Likewise, previous studies describe lower levels of physical activity, as well as higher consumption of sugary drinks and fast food, associated with their lifestyle and academic routine[4,5,6]. Being in a stage of life considered the last period of consolidation of healthy behaviors and lifestyles[7], interventions aimed at improving health in college students have been carried out and have shown to obtain a significant increase in physical activity[8]. Timely mannered interventions can reduce obesity in key age groups and reduce chronic disease risks and premature death in the long run.

Also, sedentary behavior is an increasingly prevalent condition among college students. Sedentary behavior is defined as any behavior that involves an energy expenditure of less than 1.5 metabolic equivalents, which includes activities involving sitting, reclining, or lying down. This concept differs from physical inactivity, which is the condition of not meeting the requirements to define moderate or high level of physical activity[3]. Sedentary behavior self-report among this group is higher compared to the young adult population[9]. The effects of sedentary behavior on student health have been reported in previous studies. For example, the number of hours a college student spends sitting has been associated with higher levels of physical discomfort and sleepiness[10] and elevated serum levels of pro-inflammatory markers[11]. Similarly, it has been suggested that sedentary behavior increases the risk of cardiovascular disease or diabetes mellitus[12]. Prospective studies in the adult population have shown higher overall mortality or mortality from cardiovascular events among physically active people who sat for more than eight hours a day[13,14]. These findings have led to consider sedentary behavior as a potential cardiovascular risk factor independently from physical inactivity[14,15].

Previous literature reports high percentages of physical inactivity and sedentary behavior among medical student populations[16,17]. Therefore, developing healthy habits that promote greater physical activity or decrease sedentary behavior among medical students leads to health benefits and allows them to be active promoters of healthy habits in their community[15]. However, physical activity and sedentary lifestyle and the relationship between these two events and their implications on medical student's health are inconclusive[12,14]. Therefore, the present study aims to determine the prevalence of physical activity and sedentary behavior among medical students of a Peruvian public university.

Methods

Study design

Analytical cross-sectional study conducted during 2018. The population consisted of 973 undergraduate students from the first to the sixth year of medical school at the Universidad Mayor de San Marcos in Lima, capital of Peru. A census was conducted that included every student enrolled in the academic year. Cases with missing data on variables of interest were excluded. Likewise, under the International Physical Activity Questionnaire (IPAQ) stipulations, cases were excluded according to data cleaning and treatment procedures guidelines for data processing and analysis of this instrument[18].

Physical activity level and sedentary lifestyle

The short version of the International Physical Activity Questionnaire[18] was used to assess the level of physical activity and sedentary lifestyle. This version is recommended for estimating the prevalence of physical activity levels compared with the long version. Additionally, it facilitates physical activity analysis in different contexts, but its application is limited[17,20]. This self-administered questionnaire has been widely used worldwide. It has an adequate test-retest reliability of up to 0.79[19], and a median correlation for criterion validity with accelerometer (Spearman's coefficient: 0.30; 95% confidence interval: 0.23 to 0.36)[20], according to literature. The IPAQ is considered one of the best instruments for assessing physical activity in university students[21]. It consists of a total of seven questions, six of which report the number of days and duration of time (in minutes) spent in vigorous, moderate-intensity physical activity and walking in the last seven days. The seventh question asks the number of hours that the participant was sitting in the last week.

The collected information was subjected to standardized methods of data cleaning, exclusion of maximum and minimum values, and data truncation rules according to the questionnaire user's guide. Physical activity measured through the IPAQ is calculated in metabolic equivalents per minute per week and is grouped into three categories, which were calculated using the following formulas:

- High-intensity physical activity: 8.0 metabolic equivalents per minute of vigorous physical activity per day that he/she performed vigorous physical activity.
- Moderate-intensity physical activity: 4.0 metabolic equivalents per minute of moderate physical activity per day of moderate physical activity.
- Walking: 3.3 metabolic equivalents per minute of walking per day.

Total physical activity is defined as the sum of the three categories of physical activity (i.e., high-intensity physical activity, plus moderate-intensity physical activity, plus walking). Physical activity was also categorized into three levels according to the methodology of the International Physical Activity Questionnaire. The high level is constituted by cases that meet any of the following criteria:

- High-intensity activity on at least three days that accumulate a minimum of 1500 metabolic equivalents-minutes/week.
- Seven or more days of any combination of physical activity that accumulates at least 3000 metabolic equivalents-minute/week.

The moderate level includes cases that meet any of the following criteria:

- Three or more days of high-intensity activity of at least 20 minutes daily.

- Five or more days of moderate-intensity activity and/or walking of at least 30 minutes daily.
- Five or more days of any combination of walking, moderate-intensity activity and high-intensity activity that achieves a minimum of 600 metabolic equivalents-minutes per week.

The low level of physical activity includes cases not included in the previous two levels.

The time participants spent sitting during the last seven days is recorded in the seventh question of the questionnaire, expressed as hours per day. For analysis purposes, a sedentary lifestyle is defined as sitting more than eight hours per day[17].

Covariables

Potential covariates of sedentary behavior and physical activity were chosen based on studies of Yousif et al. [16], Wattanapisit et al. [17], and based on epidemiological interest. These were added to the questionnaire and included: sex (male/female), age (younger than 20 years old/20 to 24 years old/older than 25 years old), marital status (single/married-cohabiting), physical disability (presence of any permanent impairment to move or walk), height (in meters), and weight (in kilograms). With these last two variables, the body mass index was calculated and categorized (underweight/normal/overweight-obese). To categorize academic year (pre-clinical/clinical), students were grouped from first to the third year and from fourth to the sixth year as per previous reports[17].

Procedure

After coordinating with teachers or class delegates, the questionnaires were distributed to the whole population according to the availability of class schedules for each academic year. The survey was conducted without a time limit for completion. The questionnaire was self-administered by the students who received prior verbal guidance from the research team and written guidance on the questionnaire. With the information collected, a database was generated by the research team. A check and review of data were carried out to find possible inconsistencies when filling out the database.

Ethical Aspects

Ethics

The present work was reviewed and approved by the Research Ethics Committee of the University of Sciences and Humanities. The participation of each student was voluntary and anonymous. Written informed consent was requested before the survey start. The database generated with the coded surveys was used only by the research team.

Statistical analysis

Statistical package Stata v12 (StataCorp, TX, United States) was used. Confidence intervals of 95% and a significance level of 0.05 were considered. Categorical variables were described by frequencies and percentages, and continuous variables by medians and interquartile ranges. The distribution of continuous variables was determined as non-normal using the Shapiro Wilk test. Chi-square tests and Fisher's exact test were used to describe levels of physical activity according to study variables. To evaluate the relationship between physical activity levels and variables of interest – such as sedentary lifestyle, sex, age group, academic year, and body mass index – crude and adjusted prevalence ratios and confidence intervals were calculated. The instruments used for these calculations were generalized linear models with the Poisson family, logarithmic link function and robust variance. Collinearity between variables was assessed using the variance inflation factor, which considered coefficients greater than 10 to be high.

Results

A total of 693 students participated in the survey (71.2% response rate), of which 175 were excluded due to incomplete data, and five cases due to the data cleaning process according to questionnaire guidelines. The final sample consisted of 513 medical students, 55.9% of whom were men. Most students were between 20 and 24 years of age (63.9%). Overweight or obesity was present in 36.8% of the respondents. Characteristics according to sex are also described in Table 1.

Table 1. Characteristics of the study population.

Characteristics	Total (n = 513)		Male (n = 287)		Female (n = 226)	
	%	(95% CI)	%	(95% CI)	%	(95% CI)
Age group						
Under 20 years old	9.0	(6.5 to 11.4)	8.7	(5.4 to 12.0)	9.3	(5.5 to 13.1)
20 to 24 years old	63.9	(59.8 to 68.1)	61.6	(56.0 to 67.3)	66.8	(60.6 to 73.0)
Over 25 years old	27.1	(23.2 to 31.0)	29.6	(24.3 to 34.9)	23.9	(18.3 to 29.5)
Marital status						
Single	97.5	(96.1 to 98.8)	97.6	(95.8 to 99.4)	97.3	(95.2 to 99.5)
Married/cohabitating	2.5	(1.2 to 3.9)	2.4	(0.6 to 4.2)	2.7	(0.5 to 4.8)
Physical disability	4.1	(2.4 to 5.8)	5.2	(2.6 to 7.8)	2.7	(0.5 to 4.8)
Academic year						
Preclinical	33.7	(29.6 to 37.8)	34.5	(29.0 to 40.0)	32.7	(26.6 to 38.9)
Clinical	66.3	(62.2 to 70.4)	65.5	(60.0 to 71.0)	67.3	(61.1 to 73.4)
*Height (cm)**	1.66	(1.60 to 1.71)	1.7	(1.67 to 1.73)	1.59	(1.55 to 1.63)
*Weight (kg)**	65.00	(58.00 to 75.00)	72.00	(67.00 to 80.00)	58.00	(52.00 to 63.00)
BMI						
Normal	63.2	(59.0 to 67.3)	49.8	(44.0 to 55.6)	80.1	(74.9 to 85.3)
Overweight/obese	36.8	(32.7 to 41,0)	50,2	(44.4 to 56.0)	19.9	(14.7 to 25.1)
Time spent sitting (hour/week)*	7.00	(5.00 to 9.00)	6.00	(5.00 to 8.00)	8.00	(5.00 to 10.00)

BMI: body mass index.

CI: confidence interval.
n: number of individuals included in the analysis of sedentary behavior.
cm: centimeters.
kg: kilograms.
*: continuous variables (height, weight, sitting time) were described in terms of median and interquartile range.

Of all participants, 25.3% had a low level of physical activity (Table 2). Likewise, we found that 35.0% of women presented a low level of physical activity, higher than the 17.8% found in men (p < 0.001). According to age, 45.7% of students under 20 years old presented a low level of physical activity. This was significantly higher than in students over 25 years old (30.2%; p = 0.004).

Table 2. Level of physical activity according to variables of interest in medical students (N = 513).

Variables	Low physical activity		Moderate physical activity		High physical activity		
	%	(95% IC)	%	(95% IC)	%	(95% IC)	P value
Gender							< 0.001
-Woman	35.0	(28.7 to 41.2)	50.0	(43.5 to 56.5)	15.0	(10.4 to 19.7)	
-Male	17.8	(13.3 to 22.2)	49.5	(43.7 to 55.3)	32.8	(27.3 to 38.2)	
Age group							0.004
-Under 20 years old	45.7	(31.1 to 60.2)	39.1	(24.8 to 53.4)	15.2	(4.7 to 25.7)	
-20 to 24 years old	20.4	(16.0 to 24.8)	53.4	(47.9 to 58.8)	26.2	(21.4 to 31.0)	
-Over 25 years old	30.2	(22.5 to 37.9)	44.6	(36.3 to 52.9)	25.2	(17.9 to 32.4)	
Academic year							0.214
-Preclinical	30.1	(23.2 to 36.9)	46.2	(38.8 to 53.7)	23.7	(17.3 to 30.1)	
-Clinical	22.9	(18.5 to 27.4)	51.5	(46.1 to 56.8)	25.6	(20.9 to 30.2)	
BMI							0.454
-Normal	26.9	(22.0 to 31.7)	49.7	(44.2 to 55.2)	23.5	(18.8 to 28.1)	
-overweight/obese	22.8	(16.7 to 28.8)	49.7	(42.6 to 56.9)	27.5	(21.1 to 33.9)	
Total	**25.3**	**(21.6 to 29.1)**	**49.7**	**(45.4 to 54.0)**	**25.0**	**(21.2 to 28.7)**	

CI: confidence interval.
BMI: body mass index.

Taking moderate physical activity level as a reference, we performed a crude and adjusted analysis between levels of physical activity and variables of interest, which are described in Table 3. In a multivariate analysis, male sex (adjusted prevalence ratio: 0.62; 95% confidence interval: 0.46 to 0.83) and students between 20 to 24 years old (0.55; 0.39 to 0.79) were associated with a lower prevalence of low level of physical activity, compared to female sex and with students younger than 20 years old, respectively. Likewise, male sex was associated with a higher prevalence of high physical activity level (1.74; 1.23 to 2.46) compared to female sex.

Table 3. Crude and adjusted prevalence ratio of the relationship between physical activity levels and variables of interest.

Variables	Low physical activity versus moderate physical activity				High physical activity versus moderate physical activity			
	Crude PR	(95% CI)	Adjusted PR	(95% CI)	Crude PR	(95% CI)	Adjusted PR	(95% CI)
Sex								
-Woman	1	a	1	a	1	a	1	a
-Male	0.64	(0.48 to 0.86)	0.62	(0.46 to 0.83)	1.72	(1.23 to 2.41)	1.74	(1.23 to 2.46)
Age group								
-Under 20 years old	1	a	1	a	1	a	1	a
-20 to 24 years old	0.51	(0.36 to 0.73)	0.55	(0.39 to 0.79)	1.18	(0.61 to 2.26)	1.28	(0.65 to 2.54)
-Over 25 years old	0.75	(0.52 to 1.09)	0.87	(0.57 to 1.32)	1.29	(0.65 to 2.55)	1.34	(0.65 to 2.77)
Academic Year								
-Preclinical	1	a	1	a	1	a	1	a
-Clinical	0.78	(0.59 to 1.04)	0.80	(0.58 to 1.11)	0.98	(0.72 to 1.33)	0.98	(0.71 to 1.34)
BMI								
-Normal weight	1	a	1	a	1	a	1	a
-Over-weight/obese	0.89	(0.66 to 1.21)	1.06	(0.78 to 1.43)	1.11	(0.83 to 1.48)	0.96	(0.72 to 1.28)

PR: prevalence ratio.
CI: confidence interval.
BMI: body mass index.

In addition, the presence of sedentary behavior (i.e., sitting time greater than eight hours per day) was higher among females (50.9%; 95% confidence interval: 44.3 to 57.4), students younger under 20 years old (60.9%; 46.6 to 75.2), pre-clinical group (55.5%; 48.1 to 62.9), and low level of physical activity (54.6%; 46.0 to 63.2).

Table 4. Sedentary behavior in medical students according to variables of interest and crude and adjusted prevalence ratios (N = 513).

Variables	Prevalence				Sedentary behavior (greater than or equal to 8 hours/day)			
	N	%	(95% CI)	P value	Crude PR	(95% CI)	Adjusted PR	(95% CI)
Sex				0.033				
-Woman	115	50.9	(44.3 to 57.4)		1	-	1	-
-Male	119	41.5	(35.7 to 47.2)		0.81	(0.68 to 0.98)	0.88	(0.72 to 1.08)
Age group				0.001				
-Under 20 years old	28	60.9	(46.6 to 75.2)		1	-	1	-
-20 to 24 years old	159	48.5	(43.0 to 53.9)		0.80	(0.62 to 1.03)	0.94	(0.72 to 1.22)
-Over 25 years old	47	33.8	(25.9 to 41.7)		0.56	(0.40 to 0.77)	0.68	(0.48 to 0.97)
Academic year				0.001				
-Preclinical	96	55.5	(48.05 to 62.94)		1	-	1	-
-Clinical	138	40.6	(35.35 to 45.83)		0.73	(0.61 to 0.88)	0.81	(0.66 to 0.99)
BMI				0.555				
- Normal weight	151	46.6	(41.2 to 52.1)		1		1	-
- Overweight/obese	83	43.9	(36.8 to 51.0)		0.94	(0.77 to 1.15)	1.05	(0.86 to 1.29)
Physical activity level				<0.001				
-Low	71	54.6	(46.0 to 63.2)		1		1	
-Moderate	123	48.2	(42.1 to 54.4)		0.88	(0.72 to 1.08)	0.91	(0.74 to 1.11)
-High	40	31.3	(23.2 to 39.3)		0.57	(0.42 to 0.77)	0.60	(0.44 to 0.83)

N: number of individuals included in the analysis of sedentary behavior.
PR: prevalence ratio.
CI: confidence interval.
BMI: body mass index.

A multivariate analysis was performed between sedentary behavior and study variables, in which the clinical category (adjusted prevalence ratio 0.81; 95% confidence interval: 0.66 to 0.99) and students over 25 years old (0.68; 0.48 to 0.97) were associated with a reduction of sedentary behavior; compared to the pre-clinical group and students younger than 20 years old, respectively. Likewise, a high level of physical activity was significantly associated with lower sedentary behavior (0.60; 0.44 to 0.83) compared to a low level of physical activity (Table 4).

Discussion

The present study evaluated the level of physical activity among medical students, which was lower among females and students over 25 years old. The association between male sex and the presence of high levels of physical activity reaffirm this finding. In addition, the prevalence of sedentary behavior among students: was higher than reported in previous studies, was higher among students in their final years and was independent of low levels of physical activity.

The prevalence of overweight and obesity of medical students in our study was 31.0% and 4.5%, respectively. These findings are lower than described in the Peruvian population (37.3% overweight and 22.7% obesity) according to the National Institute of Statistics and Informatics of Peru in 2018[22]. This last report also informs a geographic variation of these values, where some coastal cities presented a prevalence above the national one. Along these lines, previous studies conducted in coastal cities, such as Ica[23] and Trujillo[24], found a prevalence of obesity/overweight in medical students of 40 and 50%, respectively. In contrast, only 27.8% of students in a medical school in Cuzco[25] (a city in the Peruvian highlands) were overweight, and 3.9% were obese; these results are lower than those found in our study. Internationally, in Mexico, 41.9% of medical students were overweight, and 6.5% were obese[26], which is higher than found in our study population. In some countries and more urbanized cities, these differences may result from higher consumption of ultra-processed food and sugary drinks. These aspects lead to increased overweight and obesity in different social and age groups[27].

Our study showed that the percentage of men with a high level of physical activity was higher than that found in women. This statistical difference in the distribution of physical activity levels and sex has been previously described in medical students[16,17,28] and among the general university population[29,30]. Likewise, our multivariate analysis found a significant association between sex and high physical activity levels. Chung et al. [31] showed that the probability of having an adequate level of physical activity was 3.16 times higher among men compared to women, a result similar to ours. In contrast, our study did not find an association between sex and low physical activity level. This result aligns with Zevallos-Morales et al. [32], who found no significant association. The relationship between sex and high physical activity level can be explained by cultural and social factors that encourage men to develop activities that involve greater physical demand and, on the contrary, do not encourage women to develop them[14].

Similarly, we found that students under 20 years old presented the highest prevalence of low physical activity levels. This result was seen in Colombian students[33], although the opposite was found

among university students in Poland[34]. The greater physical inactivity in young people, which was also observed in Peruvian adults by Tarqui and colleagues, could be linked to existing differences in behavioral and cultural patterns between generations[35].

The average number of sitting hours in our study was comparable to what is reported by Ge et al. [28] in medical students. The presence of sedentary behavior was estimated according to the number of sitting hours. This was seen in 45.6% (95% confidence interval: 41.3 to 49.9) of students and was higher than the 31.0% (30.4 to 32.6) estimated in the meta-analysis by Castro et al. [9].

Belonging to the last academic years of school and older age was inversely associated with sedentary behavior. Studies in both Colombian and Asian university students reported an independent distribution of sedentary behavior among age groups[33,36], which differs from our findings. In contrast, our results are in line with Wattanapisit and colleagues[17], whose study showed a higher prevalence of sedentary behavior among pre-clinical students (87.9%) compared to those in clinical years (55.1%). The decrease in sedentary lifestyle among students who reach the last academic years of human medicine has been explained by the greater number of hours they are obliged to invest in clinical rotations and hospital shifts. This ensures that they spend less time sitting, therefore, engaging in an adequate amount of physical activity.

Achieving a high level of physical activity was found to be inversely associated with sedentary behavior. Despite this, this was seen in the lowest proportion of students in our study. Even among students with a high level of physical activity, the prevalence of sedentary behavior was similar to the overall estimate of other studies[9,30]. On the other hand, there was no association between low physical activity level and a sedentary lifestyle. This last finding is compatible with Matusiak-Wieczorek et al. [15], who found no statistical difference between physical activity levels and the amount of time spent sitting. The independence of sedentary behavior among people with a low level of physical activity opens the possibility of simultaneous occurrence of both phenomena. This is important to be aware of, as previous studies suggest that for the latter in question, lower amounts of sitting hours per day could even increase all-cause mortality in the long term[37].

Recommendations

Our results highlight the importance of implementing strategies to promote the development of physical activity among medical students. Likewise, the high prevalence of sedentary behavior, which was larger than other studies, suggests the need for measures to reduce sedentary behavior among students from the beginning of university life. We propose the development of longitudinal studies to evaluate further the relationship between physical activity and sedentary behavior and the impact of both situations on student health.

Limitations and strengths

This study has limitations that should be considered when analyzing the results. Our study has a cross-sectional design, which prevents us from inferring causality. Nevertheless, our analysis allows us to obtain associations that may serve as evidence to develop future longitudinal studies. Physical activity and sedentary behavior were obtained by self-report, which may generate a higher and lower estimate of the true values, respectively. Similarly, participants' weight and height were also obtained through self-report, rather than using more objective tools to estimate them. This makes our data susceptible to recall or social desirability bias. Furthermore, our study did not include a greater number of possible confounders in the relationships assessed. Opting for the use of a short questionnaire was done to prevent respondents from becoming fatigued on its resolution, but this may affect the quality of answers. Our study was conducted on medical students at a national university, which does not make it possible to generalize our findings to other settings.

The strengths of this study include the use of the International Physical Activity Questionnaire, which is an instrument with proven validity and has been used among university students worldwide, allowing for comparisons with other studies[38]. Finally, given the scarce information on sedentary lifestyles and low physical activity in the university population in Peru, our study provides information that helps to elucidate the relationship between these two variables.

Conclusions

We found that a low level of physical activity in medical students was more prevalent among females and younger students. Likewise, we found that sedentary behavior occurs more often than inactivity and is higher among students in early school years.

A significant decrease in the prevalence of sedentary behavior was only observed among those students who achieved high physical activity levels. This finding shows us that even students with moderate physical activity – who constitute half of our analyzed population – spend enough sitting hours per day to be defined as sedentary.

Notes

Authorship roles

AJA: conceptualization, methodology, software, validation, formal analysis, research, resourcing, data curation, original article preparation, article review and editing, visualization, oversight, project management, and fund acquisition. TPM: conceptualization, research, resources, data curation, original article preparation, article review and editing, visualization, supervision, project management, and funding acquisition. LB: conceptualization, research, resources, data curation, original article preparation, article review and editing, visualization, and fund acquisition. KM, JSP, RGP, IFR: conceptualization, research, resources, data curation, preparation of the original article, visualization and acquisition of funds. JMQ: conceptualization, methodology, software, validation, formal analysis, research, resources, article review and editing, visualization and supervision.

Conflicts of interest statement

The authors completed the ICMJE conflict of interest statement and declared that they received no funding for the completion of this article; have no financial relationships with organizations that may have an interest in the published article within the last three years; and have no other relationships or activities that may influence the publication of the article. Forms can be requested by contacting the responsible author or the Editorial Board of the Journal.

Acknowledgments

None.

Funding

The authors declare they did not receive funding for this article.

Ethical considerations

The study was approved by the Research Ethics Committee of the University of Sciences and Humanities, with file code: ID-023.

Access to data

The database used in the present study and the data dictionary are accessible through a data-sharing repository. The statistical analysis plan may be made available upon request.

Submission language

Spanish

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