



Article of scientific and technological research

Nutrition and physical activity of students attending a public university in Cartagena, Colombia

Alimentación y actividad física en estudiantes modalidad presencial de una universidad pública de Cartagena, Colombia

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ABSTRACT

Keywords:
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lifestyle.

Introduction: Food and physical activity are part of the habits and behaviors that allow to achieve well-being and improve health. These habits are influenced by personal, environmental and social factors. **Objective:** To identify the diet and physical activity in students of face-to-face modality of a public University of Cartagena. **Method:** the 1,292 students were selected by stratified probabilistic sampling, using the virtual "Survey of Health Risk Factors Related to Lifestyle" of the Colombian National Institute of Health. **Results:** The results indicate that the female sex predominated in the population, affiliated to the subsidized regime in socioeconomic stratum 1 and 2; enrolled in the nursing, engineering, human sciences and economic sciences mainly. As for food, it was found that the majority ate whole fruits and vegetables, but the consumption of fried foods, packaged/candy foods, sugary drinks, and the addition of salt to already served meals is high. **Conclusions:** The students have poor healthy diets and do physical activity a few days a week. It is necessary to promote institutional strategies to strengthen healthy habits by creating spaces that promote and maximize the health of the student population.

RESUMEN

Palabras clave:
conducta
alimentaria;
ejercicio
físico;
servicios de
salud para
estudiantes;
estilo de vida
saludable.

Introducción: la alimentación y la actividad física hacen parte de los hábitos y/o comportamientos que permiten alcanzar el bienestar y mejorar la salud. Estos hábitos están influenciados por factores personales, ambientales y sociales. **Objetivo:** identificar la alimentación y actividad física en estudiantes de modalidad presencial de una universidad pública de Cartagena, Colombia. **Método:** 1292 estudiantes fue seleccionados mediante muestreo probabilístico estratificado, se utilizó la virtual "Encuesta de factores de riesgo en salud relacionados con el estilo de vida" del Instituto Nacional de Salud de Colombia. **Resultados:** los resultados indican que en la población predominó el sexo femenino, afiliados al régimen subsidiado en estrato socioeconómico 1 y 2; inscritos a la enfermería, ingeniería, ciencias humanas y ciencias económicas, principalmente. En cuanto a la alimentación se encontró que la mayoría comió frutas enteras y verduras; pero, es alto el consumo de fritos, alimentos de paquetes/golosina, bebidas azucaradas y adición de sal a las comidas ya servidas. **Conclusiones:** los estudiantes tienen una alimentación poco saludable y realizan actividad física pocos días a la semana. Se requiere promover estrategias institucionales para fortalecer hábitos saludables creando espacios que potencien y maximicen la salud de la población estudiantil.

INTRODUCTION

Diet and physical activity are part of the habits and behaviors that allow for well-being and improved health¹. Personal, environmental, and social factors influence these habits. Although maintaining a healthy lifestyle does not guarantee a longer life, the practice does affect the strengthening of a better quality of life². The Ministry of Health and Social Protection has developed the 4*4 Strategy to prevent and control Colombia's four most prevalent chronic diseases, which affect people of all ages. This strategy recognizes physical inactivity, unhealthy eating, harmful use of alcohol, and consumption and exposure to cigarette smoke as the four most crucial behavioral risk factors^{3,4}.

The beginning of university studies is a transition process made up of numerous changes at an emotional, physiological, environmental, educational, nutritional, and family level that can generate risk behaviors that affect the lifestyle and health of young people due to the extended class days, stress, and new responsibilities^{5,6}.

Research in higher education institutions shows that many students need to understand the importance of a healthy diet to counteract the physical and mental exhaustion that university studies can generate. Not organizing themselves properly, they often postpone or skip eating nutritious meals before classes, which can lead to exhaustion, lack of concentration, and decreased performance⁷. At the national level and specifically in the Caribbean region, Herazo-Beltran *et al.*,⁸ found in a study carried out in seven universities that 87.3% of students have inadequate or low lifestyles. Among them, 89.1% do not perform physical activity, and 95% do not consume fruits and vegetables, but they consume high sugary products.

In Chile, it was identified that 38.5% of the students interviewed are sedentary; similar data was found in Colombia, where 31.6% spend between five and eight hours a day in academic activities that do not include physical activity and that sometimes distort schedules. of feeding^{9,10}.

According to the National Survey of Nutritional Situation of Colombia (2015)¹¹, more than half of Colombian youth and adults are overweight (56.5%). Of these, 37.8% are overweight, and 18.7% are obese. Obesity is related to physical inactivity in

48.9% of the population. The worrying situation because bad habits increase the risk of dying from Chronic Noncommunicable Diseases, which cause 41 million deaths each year, which represents 71% of deaths worldwide, of these 17.9 million deaths per year are due to cardiovascular diseases, and 1.6 million deaths per year are due to diabetes¹².

Although the university has not traditionally focused on promoting a culture of health among students, which can increase the frequency of unhealthy habits¹³, in recent years, higher education institutions have worked on the development of standards and policies to promote individual and collective health and well-being through university wellness programs¹⁴, with the creation of strategies to reduce the risk factors to which students are exposed in their daily lives. These factors include discontinuous schedules, spending much time in front of screens, a sedentary lifestyle, risky eating behaviors, addictions, and social violence, all of which can increase health risks¹⁵.

According to the above, this study is pertinent since knowing students' lifestyles in the university environment allows for identifying the needs in relation to creating sustainable and beneficial educational strategies for university students. Therefore, this study aimed to identify eating habits and physical activity in face-to-face students at a public university in Cartagena, Colombia, in 2021.

METHOD

Design of investigation

A descriptive study was designed.

Population and sample

A population made up of 11,440 students of the face-to-face modality of a public University of Cartagena and an estimated sample size of 1,292 students chosen randomly from the ten academic faculties of the institution, with a margin of error of 3%, an expected prevalence of 50% and a confidence level of 95%.

Random cluster sampling was used where the cluster comprises the academic program to which the student belongs (Table 1).

Table 1. Distribution of participants by academic unit.

Academic unit	No.	Sampling fraction	Sample
School of Economics	2908	25.4%	328
Faculty of Exact and Natural Sciences	762	6.7%	86
Faculty of Pharmaceutical Sciences	433	3.8%	49
Faculty of Human Sciences	712	6.2%	80
Faculty of Social Sciences and Education	1624	14.2%	183
Faculty of Law and Political Sciences	1006	8.8%	114
Faculty of Nursing	587	5.1%	66
Faculty of Engineering	2088	18.3%	236
School of Medicine	853	7.5%	96
Faculty of Dentistry	467	4.1%	53
Total	11,440	100.0%	1292

Instrument

The students filled out the Survey of Health Risk Factors Related to Lifestyle¹⁶, designed by the National Institute of Health of Colombia and endorsed by the Ministry of Health and Social Protection, which was adapted according to national surveys (ENDS, ENSIN, ENS, and School Survey), International Physical Activity Questionnaire (IPAQ), to assess lifestyles. The survey contemplated sociodemographic variables, diet, and physical activity, with closed multiple-choice questions for sociodemographic variables.

Regarding food, the consumption in the last seven days of fruits, vegetables, fried foods, sugary drinks, packaged foods, and the addition of salt to meals after being served and the frequency during the week were evaluated as follows for fruits and vegetables with the items: (once a day, two times a day, three times a day, four times a day and five days or more); for fried foods, sugary drinks, packaged foods and salt addition with the items: (every day, 2 or 3 times a week and once a week).

In physical activity, the type of activity carried out in the last seven days was categorized as follows: use of the bicycle, 10-minute walk as a means of transportation, moderate physical activity, vigorous physical activity, and walking as physical activity;

and frequency of these during the week in time invested (Less than 30 minutes, 30 minutes to 1 hour, 1 hour to 1 hour and 30 minutes, 1 hour and 30 minutes to 2 hours, 2 hours to 2 and a half hours, More than two and a half hours or Do not know).

Procedure

To obtain the information, the data collection technique was used in a virtual, individual, and voluntary way, for which informed consent was provided to use the information provided in the investigation.

The collected data were included in the Microsoft Excel 10.0 database and analyzed with the statistical package SPSS Version 24.0, and the normality of the quantitative variables was established through the Jarque-Bera test to establish measures of central tendency as mean and median, and the measures of dispersion for the standard deviations.

Declaration of ethical aspects

From the point of view of research ethics, this project is based on various standards used at the national and international levels. The first is the Declaration of Helsinki, whose emphasis is to show that the purpose of research studies in medicine with the human species is to strengthen the methods for prevention,

diagnosis, and therapeutic interventions, based on the understanding of the causes, development, and consequences of diseases.

The second is Resolution No. 008430 of 1993 of the Ministry of Health, where the ethical, scientific, and administrative regulations for health research are defined; according to article 10 this study is classified as research without risk because the biological, physiological, psychological, or social characteristics of the participating population were not intervened or intentionally modified with the instrument used. Therefore, it does not modify the health status of the people studied and is accepted under the bioethical principles of autonomy, non-maleficence, and beneficence. The ethics committee of the Universidad de Cartagena, Colombia, endorsed the research.

RESULTS

The participants of this study were 1,292 students of the face-to-face modality of a university in Cartagena, where the female sex predominates with 67.4% and 32.6% is male, 48.4% are subsidized, 44.4% of contributory regime, 3.7% special regime and 3.5% uninsured, 40.6% socioeconomic stratum 1, 38.2% are stratum 2, 18.6% stratum 3 and 2.5% stratum 4 and 5. 87.5% belong to the urban area and 12.5% to the rural area (Table 2).

Table 2. Sociodemographic characteristics of the participants.

Characteristics		Frequency	Percentage
Sex	Female	871	67.4
	Male	421	32.6
Social Security Type	Contributory	574	44.4
	subsidized	625	48.4
	Special	48	3.7
	Uninsured	Four. Five	3.5
Residence Area	Rural	160	12.4
	Urban	1132	87.6
Socioeconomic	1	525	40.6
	2	494	38.2
	3	240	18.6
	4	26	2
	5	7	0.5

Regarding food, it was found that 53.2% of the students ate whole fruits in the last seven days. The consumption of fried foods in the last week at the time of the survey reached 89%, surpassing all other types of food. The consumption of packaged foods

and sugary drinks exceeds the consumption of fruits. (Figure 1).

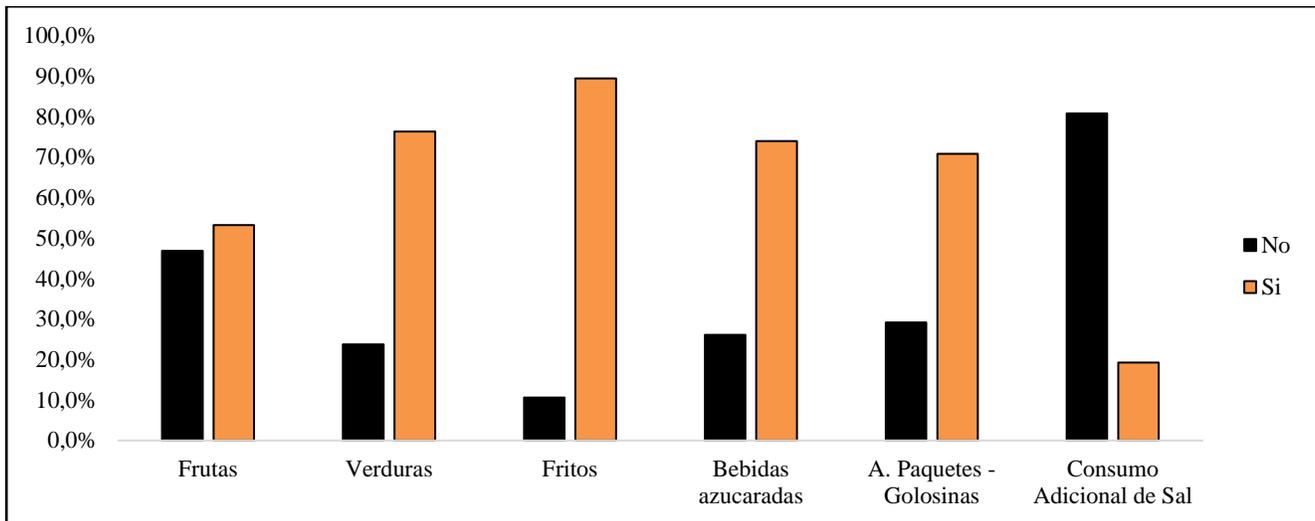


Figure 1. Student nutrition in the last seven days.

56.6% of the students surveyed consume vegetables once a day, while 61% state that they consume fruits once a day. Nearly a third of those surveyed consume fruits and vegetables more than twice a day, 89.4% fried, of these 66.2% two or three times a week, 70.8% packaged foods or sweets, of which 51.5% do it two to three times a week, and 73.9% drank sugary

drinks of which 52.8% do it two to three times a week and 19.3% add salt to the plate. These 44.2% do it twice or thrice a week, and 19.7% daily (Figure 2).

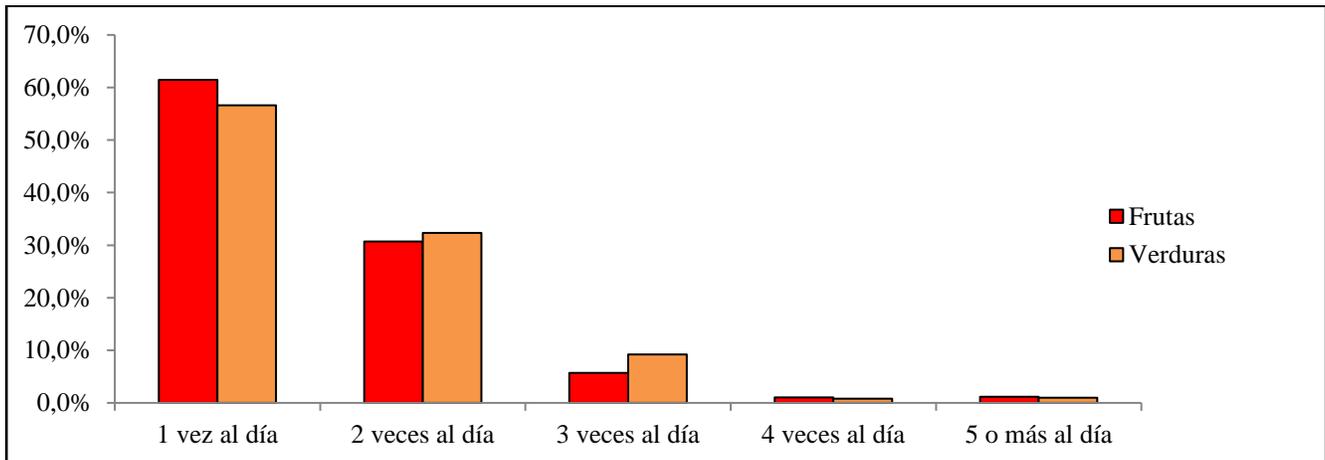


Figure 2. Frequency of fruit and vegetable consumption during the week.

In physical activity, 67.8% walked for 10 minutes, 52.3% performed vigorous physical activity, 22.8% did it three days a week, and for 31 to 50 minutes, 30.8% of those surveyed who performed this activity, and 20.6 more than 75 min. 55.4% practiced moderate physical activity, of which 21.9% did it for three days, 41.9% did this activity from 30 minutes

to an hour, and 54.6% walked for exercise three days a week on 21,3%. 10.7% used the bicycle as a means of transportation, 30% of this group stated that they do so two days a week, and 62% do so for less than 1 hour. (Figure 3).

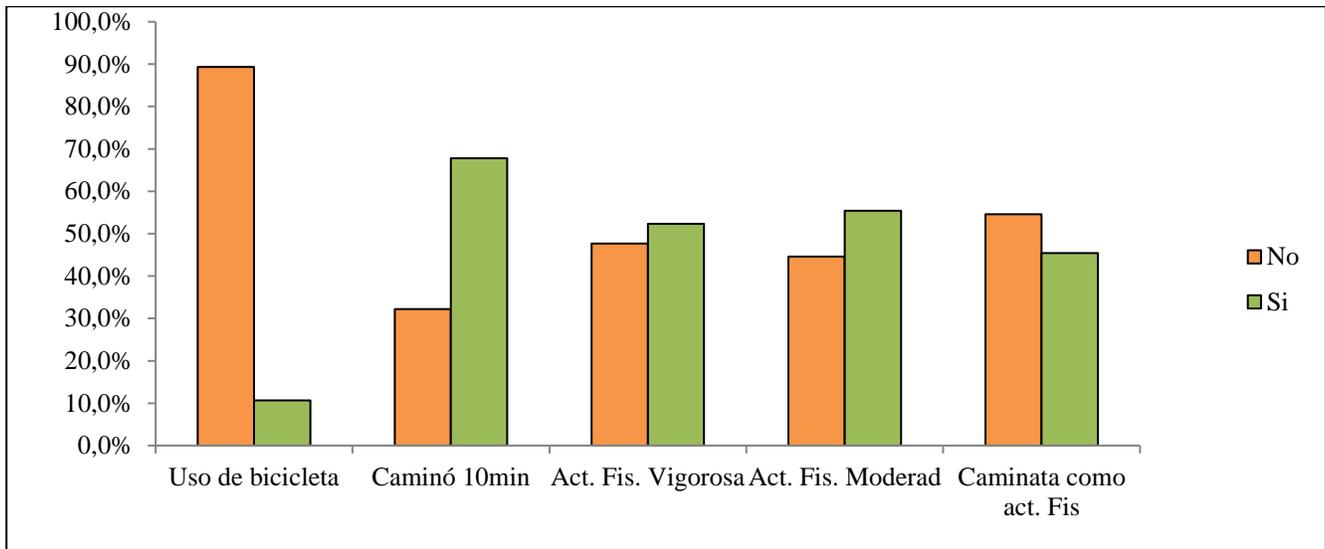


Figure 3. Types of physical activity performed by students in the last seven days.

Bicycling occurs more frequently between one and two days a week, and walking, 58% of the students surveyed report doing vigorous physical activity for 3 to 5 days. Likewise, 53% of those surveyed state

that they carry out moderate physical activity 3 to 5 days a week while walking as a physical activity will be carried out more frequently between 2 and 3 days a week (Figure 4).

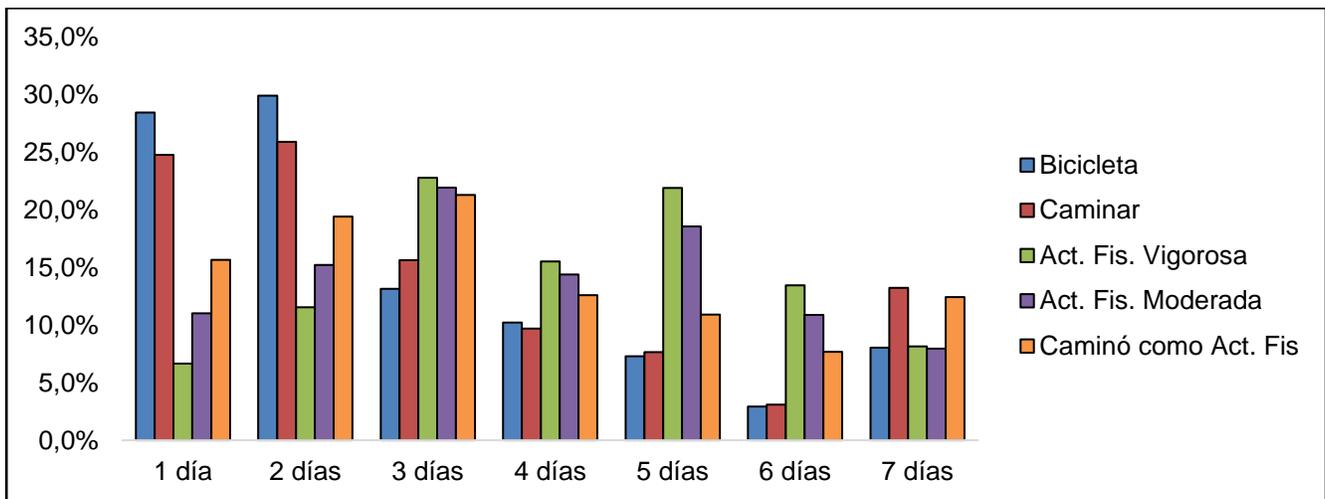


Figure 4. Frequency of physical activity carried out by students in the last week.

DISCUSSION

In the present study, eating habits and physical activity were identified in face-to-face students of a public university in Cartagena. The changes in the university stage are a highly studied subject because it constitutes an essential period in the life of young people for the development of new skills and the acquisition of new challenges directly related to risk factors for the maintenance of health due to transformations in daily activities¹⁷.

Regarding food, more than half of the students (53.6%) ate whole fruits in the last seven days and 76.3% vegetables; results similar to those reported by Botello-Márquez *et al*¹⁸ in their study carried out at a university in Mexico where on average, 55% of the respondents reported maintaining a healthy diet, however, these results differ from those found by Duran *et al*¹⁹ who reports in his study carried out at a Chilean university that only 7% of the interviewees consume fruits, 27% vegetables and also mentions that the intake of alcoholic beverages, fast food, and sweets is high, similar results with the present study

where 89.2 % consume fried foods, 71.5% packaged foods or sweets and 74.1% drink sugary drinks.

This indicates that university life is closely linked to inadequate eating habits. It is also important to consider that the lower the socioeconomic level, the greater the probability of unhealthy nutrition because consuming fruits and vegetables could be more expensive. Also, educational institutions are likelier to sell fried and processed foods than fruits or other healthy foods⁸.

In Bolivia, a study found that 33.1% of the participating students prepare and eat fried and fast food due to their easy preparation; only 24.4% prepare them grilled or steamed, and 3.8% are baked²⁰. Information similar to that reported by Ruiz *et al*²¹ at the University of Huánuco-Peru, where 30.1% of the university students interviewed consume sweets more than twice a week and 9.7% every day, 22.1% consume energy drinks more than twice a week, 84.9% consume grilled or grilled chicken and 74.9% sausages and potatoes.

From the above, it can be inferred that students, due to their socioeconomic conditions and the role or responsibilities they play, tend to consume the food they have within their reach or the ones that can prepare in the shortest possible time, taking into account that academic activities take a long time, they generate stress and even expenses, therefore, food goes to the background, this is the need that must be corrected with the design of institutional policies focused on student access to healthy and affordable food¹⁷. Salt consumption It was found that 19.3% add salt to the food that is already on the plate ready to eat. Of these, 44.2% do so two or three times a week, and 19.7% do it every day, data that agrees with national statistics; according to the Ministry of Health, 16.7% of Colombians add salt to food after it is cooked and served, a practice carried out more frequently in young people between the ages of 19 and 30. This is an important figure considering that excess salt consumption raises blood pressure levels and causes 30% of hypertension cases, and is associated with the appearance of gastric cancer, renal failure, and osteoporosis^{22,23}.

Therefore, it coincides with what was argued by De Piero *et al*²⁴, in that study about the fact that the diet of university students is constituted of processed products and with low micronutrients; therefore, unbalanced nutrition is considered due to the excess

consumption of unhealthy foods, as in Chile where eating behaviors are alarming, approximately 97% of the university students surveyed engage in unhealthy practices and the main reason is that they do not like to restrict themselves in what they eat (40.3%)²⁵. According to the World Health Organization²⁶, insufficient intake of fruits and vegetables is the cause of 2.7 million deaths in the world each year, and the development of gastrointestinal cancers, ischemic heart disease, and cerebrovascular accidents are also a consequence of this. Therefore, it is insisted on carrying out global actions to reduce the consumption of drinks with added sugars and to generate an increase in the cost of ultra-processed food, packages, and unhealthy drinks; it is evident that countries such as Mexico, Hungary, the Philippines, South Africa, and the United Kingdom have tried to develop actions aimed at this fight, mainly to reduce childhood obesity²⁷. A poor nutritional state can negatively affect the academic performance of university students due to the consequences generated at the psychosocial level and in the quality of life²⁸.

Concerning physical activity, it was found that 67.8% walked 10 minutes, 52.3% performed vigorous physical activity, of which 22.8% did it three days a week, and for 31 to 50 min, 30.8 % of respondents who carried out this activity and 20.6 more than 75 min. 55.4% practiced moderate physical activity, of which 21.9% did it three days, 41.9% did this activity from 30 minutes to an hour, and 54.6% walked as exercise three days a week, 21.3%. Only 10.7% used the bicycle as a means of transportation, 30% of this group stated that they do so two days a week, and 62% do so for less than 1 hour.

These results are low when compared to those of Diez and Lopez,⁵ in a study carried out with Mexican university students, which found that 57.2% of those surveyed performed vigorous physical activity at least three days a week and also walked as a recreational activity, which refers to having regular management of physical activity. In Chile, where Chales *et al*²⁵ determined that 75.3% of students walk or ride a bicycle as a means of transportation over short distances and that 52.9% do some activity or practice that generates physical effort at least three times a week for 30 minutes. Nevertheless, they are very similar to those found in Boyacá, where only 22% of university students perform physical activity with that frequency²⁹.

Physical activity is a fundamental part of a healthy lifestyle; when evaluating this dimension, in this study, it was identified that the frequency with which it is performed is low since it should be routine. According to the World Health Organization and the Pan American Health Organization, 80% of adolescents did not perform physical activity for adequate time. It recommended that adults should accumulate between 150 and 300 minutes of moderate aerobic physical exercise weekly, or between 75 and 150 minutes of vigorous aerobic physical exercise as a minimum time or carry out comparable conjunction of these in order to achieve a significant result in health, which can be achieved if daily routines that include sports or recreational activities are frequently carried out in free or leisure time, or just making changes such as using the bicycle to get around, walking to work if possible, or going to the bus stop³⁰. However, research shows that the lack of time or the lack of development of this habit may be one of the reasons that university students face this situation³¹.

For this reason, adequate spaces and scenarios must be created to promote physical activity within the institutions so that in the free moments between classes, they can carry out these activities⁸. Current research shows that unhealthy habits are highly related to the mismanagement of stress, which is related to eating behaviors and sleep. People who do not perform physical activity are likelier to become overweight or obese and therefore feel more tired and low spirits³².

In conclusion, this study has contributed to identifying the problem of lifestyles in face-to-face students of a public Universidad de Cartagena, Colombia, evidencing that they do not have healthy eating habits because even though a high percentage state that they consume fruits and vegetables as well. The number of students who frequently eat packaged food/sweets and sugary drinks is high, and a significant percentage add salt to the meals already on the plate. In the same way, physical activity is carried out a few days a week. Therefore, it is necessary to promote institutional strategies to strengthen healthy habits by creating spaces that promote and maximize the health of the student population and work towards the goal according to the new global action plan where the Pan American Health Organization intervenes by creating new alternatives among the different sectors to contribute

to active life and reduce the rates of physical inactivity in the population by 10% by 2025 and by 15% by 2030, improving infrastructure, accessibility, and safety of walking routes on foot or by bicycle³¹.

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DECLARATION ON CONFLICTS OF INTEREST

The authors declare that does not exist a conflict of interests.

AUTHORS' CONTRIBUTION

First author: Fieldwork and writing of the draft and revision of the final document.

Second author: Fieldwork and writing of the draft.

Third author: Methodological design and statistical analysis.

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