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NUTRITIONAL STATUS AND PHYSICAL ACTIVITY OF UNDERGRADUATE FRESHMEN OF HEALTH SCIENCES

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Abstract: The entry into university life can lead to the adoption of inadequate eating patterns, increasing the risk of overweight. The aim of this study was to evaluate the nutritional status of undergraduate freshmen of Health Sciences at a private University in the city of São Paulo, Brazil. This cross-sectional research investigated freshmen characteristics using a standardized questionnaire on demographic and lifestyle characteristics. Anthropometric data (weight, height, waist circumference) were also collected and Body Mass Index (BMI) was calculated. The results were analyzed using descriptive statistics. Forty-two freshmen participated, with an average age of 21 years, being 88.1% female. Most of the students reported practicing physical activity regularly (76.2%) and 26.2% were sedentary. Thirty-one percent of the freshmen never consumed alcoholic beverages and 7.1% were current smokers. One fifth of the students were overweight, and 4.8% were obese. The average abdominal circumference of the students was 77 cm, indicating no risk of chronic diseases. Men, smokers and sedentary students were those who had most overweight. We recommend that studies that monitor possible effects of academic life on the nutritional status and health of freshmen be carried out. Additionally, implementing activities to promote healthy dietary habits and sports can reduce future risks of chronic diseases in these young students.

Keywords: university students; nutritional status, lifestyle, BMI.

INTRODUCTION

Entering university life, although desired by students and parents, can represent a period of important changes for young people, which can reflect on their physical and mental health. Among these changes may be the adoption of eating patterns different from what young people were used to. It is often observed that university freshmen start to eat in an unregulated way, being able to "skip meals" or consume foods richer in calories, sugars and fats, such as *fast foods*, soft drinks and bar and packaged snacks (DE PIERO *et al*, 2015).

For some young people, this new stage implies leaving their parents' house, causing their eating habits to be strongly altered. With this new daily routine, students start to look for practical and quick alternatives to feed themselves. An example of this is the increase in the consumption of industrialized products, which are more practical, but also more caloric and with lower amounts of essential nutrients. It is also common for these students to reduce their intake of fruits and vegetables, whole grains, legumes, roots and tubers. To this consumption trend is added the decrease in physical activity and the fact that many of these young people do not have company when eating, which makes it more difficult to reconcile health, learning and pleasure (SANTOS *et al*, 2014).

Sinigaglia et al. (2024) conducted a survey with 68 university freshmen from the Santos, in the State of São Paulo, Brazil. The authors followed the students for nine months in the first academic year and found changes in the students' dietary and nutritional parameters after entering the university, with an increase in the consumption of *fast foods*, body weight gain (p<0.001) and a significant mean increase in waist circumference (p=0.003).

Another study on the eating behavior of young people, carried out with university students from student housing in Campinas,

Brazil, showed that most of them (43%) related their poor diet to the fact that they did not have a company at mealtimes. These students stated that having their meals accompanied by family members directly influenced the choice of food, making them prefer healthier food, which indicates that company and living with the family are important conditioning factors for students' food choices (BUSATO *et al*, 2015).

Food intake away from home is a common routine of many university freshmen and it is now considered determinant for the overall food intake. These meals are associated with less healthy eating habits and nutritional imbalances. Studies indicate that meals eaten away from home are unbalanced, as they include large amounts of food, are more caloric, with high levels of total and saturated fat, and contain low levels of fiber, calcium, and iron, resulting from the low consumption of milk, fruits, and vegetables (SANTOS *et al*, 2014).

Allied to inadequate eating habits, physical inactivity is also an important issue for young university students, for two reasons: because entering university is an event marked by new social relationships, with the possibility of adopting a sedentary lifestyle; and because youth is a very opportune phase to put preventive measures into practice. It is at this stage that the lifestyle is being consolidated along with the independence of the young person (FONTES; VIANNA, 2009).

A study of 175 female students, held at a University of Londrina, Brazil, showed that lunch was the main daily meal of these young women (BUSATO *et al*, 2015). In addition, at dinner, 62% opted for snacks and lighter meals and 5% were not in the habit of eating this meal, and could remain in prolonged fasting, which could trigger health problems. Most of the students (89% (n=156) maintained the minimum recommended consumption of three meals throughout the day, as recommended by the Food Guide for the Brazilian Population (2014). It should be noted that most of the students enrolled in the Nutrition Course, 68%, ate six meals a day, demonstrating the search for a healthier diet.

Among university students, there are factors such as the lack of time to eat healthier, resulting from the studies routine, and practical snacks with high energy density and few nutritious foods are commonly consumed. The daily intake of such foods can improve the risks of some nutritional deficiencies and choric diseases (FEITOSA *et al*, 2010).

In summary, the changes resulting from this new way of life, such as study hours per day, new social relationships, the adoption of behaviors and a differentiated lifestyle, can make university students great consumers of food away from home and possibly a vulnerable group to circumstances, which puts their health and quality of life at risk and worsens their nutritional status (DUARTE; ALMEIDA; MARTINS, 2013).

Due to the importance and magnitude of the estimates of the incidence of chronic diseases in Brazil, and the relationship between inadequate eating habits and the increased risk of these diseases, it is essential to evaluate whether young people entering the University, who are going through a moment of vulnerability in their health due to changes in their daily lives, have harmful dietary practices. In addition, identifying the changes in the diet that these young people go through can provide subsidies for them to be guided to make better food choices, which help them promote better physical health, concentration and cognitive performance in their studies.

The present study sought to characterize the students in relation to socioeconomic and personal data, evaluate the nutritional status of the students according to the Body Mass Index and the presence of fat in the abdominal region.

METHODS

This cross-sectional research was carried out at a private university in the city of São Paulo, from August 2019 to March 2020.

This study is part of a research project entitled "Evaluation of quality of life, health habits, nutritional status and food consumption of population groups with different diseases", with ethical approval from CAAE: 50839915.9.0000.0084.

After the ethical approval and consent of the Institution, eligible students were invited to participate in the research, being informed about all steps and procedures to be carried out. If they wished to be part of the study, the students signed a Free and Informed Consent Form (ICF). The participants of the research were guaranteed anonymity and confidentiality at all stages of the research and the university student could withdraw from his participation at any time, without any kind of charge.

SAMPLE

The study sample was composed of students recently enrolled in health undergraduate courses at a private university in São Paulo. Students who meet the following criteria were invited to join the research sample:

i. Be a freshman at the University (first year);

ii. Be between 18 and 30 years old;

iii. Not having a current diagnosis of any type of chronic diseases or limitation to physical activity;

iv. Not be undergoing any type of dietary treatment at the time of the research.

PROCEDURES AND DATA

Sociodemographic and nutritional data were collected through a questionnaire created by the *Google Docs* tool. This instrument included questions related to demographic and dietary characteristics and daily habits. Anthropometric data (weight, height, and circumference of the abdomen) were collected for subsequent calculation of BMI (kg/m²). BMI results were classified according to the cutoff points proposed by WHO (2010).

Classification	BMI (kg/m²)
Low weight	< 18.5
Normal weight	18,5 – 24,9
Overweight	≥ 25
Obesity I	30,0 – 34,9
Obesity II	35,0 – 39,9
Obesity III	≥ 40

Figure 1 - Nutritional status calssification according to Body Mass Index.

Source: WHO (2010).

The results of Abdominal Circumference (WC), measured at the level of the umbilical scar, with the use of inelastic tape, were evaluated according to the cutoff points in Chart 5.

Waist circumference (AC) (cm)		
Risk of chronic diseases	Men	Women
No risk	< 94	< 80
Increased	≥ 94	≥ 80
Substantially increased	≥ 102	≥ 88

Figure 2 - Waist circumference and risk of metabolic complications associated with obesity in men and women.

Source: WHO (2010).

STATISTICAL ANALYSIS

For the organization of the data and the tabulation of the collected information, the Microsoft Excel® program was used. In the database of the main research, anonymity and confidentiality of the data were maintained.

Possible associations between food consumption and variables related to the socioeconomic conditions of young people were evaluated, as well as lifestyle such as smoking, alcohol consumption, physical activity and nutritional status.

RESULTS

In this study, 42 students of Health Sciences from a private University in São Paulo were evaluated, most of whom were women (88.1%), with a mean age of 21 years. Most of the students were from the Nutrition undergraduate course (76.2%), followed by Physiotherapy (11.9%) and Pharmacy (4.8%).

Only 4.8% of the students lived in student dormitories, and most of the students, 69%, still lived with their parents.

Regarding lifestyle, it was observed that most students (73.8%) practiced regular physical activity and 26.2% were sedentary. Thirty--one percent of the students did not consume alcoholic beverages and, among the consumers (69.0%), 35.7% did so weekly, while 21.4% did so sporadically and 14.3% monthly. Most students (92.9%) reported not smoking.

Regarding nutritional status, according to the BMI classification, most students had normal weight (71.4%), followed by 16.7% who were overweight, 4.8% were obese and another 4.8% were underweight. The mean values and standard deviations of age, weight, height, and BMI of the participants are described in Table 1.

Anthropometric Measurements	Minimum	Maximum	Mean	Standard deviation
Age (years)	18,00	32,00	21,55	2,53
Weight (Kg)	49,00	110,00	63,19	13,50
Height (m)	1,50	1,79	1,65	0,07
BMI (Kg/m²)	18,14	40,40	23,09	4,38

Table 1 - Mean values and standard deviations of the general characteristics of university students evaluated (N=42). São Paulo, 2020.

The mean Waist Circumference value observed was 77 cm and, according to the cutoff points proposed by the WHO (2010), all students were at no risk of metabolic complications associated with central obesity.

Table 2 presents the general characteristics of the university students evaluated, in relation to gender, undergraduate course, residence, with whom they lived, smoking, alcohol consumption and how often, scholarship holder and whether they practiced physical activity.

Table 2 shows that most if the women, 78%, were eutrophic and 60% of male students were overweight. Among the Nutrition students, 25% were overweight and 33.3% of the students of the other undergraduate courses were overweight or obese (p<0,05).

Among the smokers, 33% were overweight against 23.1% of the nonsmokers (p<0,05) and 22.5% of the physical activity practitioners were overweight or obese, against 27.1% of the sedentary individuals.

DISCUSSION

This study analyzed the aspects related to the nutritional status of university freshmen of Health Sciences courses, aiming to investigate socioeconomic and lifestyle characteristics.

In the present study, there was a predominance of female students, as observed in other studies with university students from health courses in Brazil (SINIGAGLIA et al, 2024; MARCONATO; SILVA; FRASSON, 2016).

The mean age of the freshmen was 21 years old and most of the students were from the Nutrition course, as it was also observed in a study carried out at a University in the countryside of São Paulo, in which among the 28 students in the Health area, with a predominance of women (90%), also from the Nutrition course and over 18 years of age (MARCONATO; SILVA; FRASSON, 2016). In the research by Sinigaglia and collaborators, carried out in the Santos, the predominance of women (63.9%) and Nutrition students (29.5%) was also observed.

Most of the participants in the present study, 59.5%, lived in apartments and with their parents (69.0%), having their meals accompanied by family members, stating that they had a direct influence on the choice of food, probably giving preference to healthier food.

Variables	Nutritional status								Total	
	Low weight		Eutrophy		Overweight		Obesity			
	N	%	N	%	N	%	N	%	N	%
Sex										
Female	1	2,7	29	78,3	5	13,5	2	5,4	37	100
Male	1	20,0	1	20,0	2	40,0	1	20,0	5	100
Course										
Nutrition	2	6,2	22	68,8	6	18,8	2	6,2	32	100
Pharmacy	-	-	2	100,0	-	-	-	-	2	100
Physiotherapy	-	-	4	80,0	-	-	1	29,0	5	100
Other	-	-	2	66,7	1	33,3	-	-	3	100
Residence										
Apartment	1	4,0	19	76,0	3	12,0	2	8,0	25	100
House	1	6,6	9	60,0	4	26,6	1	6,6	15	100
Dormitories	-	-	2	100,0	-	-	-	-	2	100
Who does it live with?										
Parents	2	6,8	19	65,5	6	20,6	2	6,8	29	100
Friends	-	-	6	100,0	-	-	-	-	6	100
Alone	-	-	4	66,6	1	16,6	1	16,6	6	100
Other	-	-	1	100,0	-	-	-	-	1	100
Scholarship										
Yes	1	9,0	7	63,6	3	27,2	-	-	11	100
No	1	3,2	23	74,1	4	12,9	3	9,6	31	100
Smoking										
Yes	-	-	2	66,6	1	33,3	-	-	3	100
No	2	5,1	28	71,7	6	15,3	3	7,6	39	100
Alcohol consumption										
Yes	2	6,8	20	68,9	5	17,2	3	10,3	29	100
No	-	-	10	76,9	3	23,0	-	-	13	100
How often consumed alcohol										
Daily	-	-	-	-	1	100	-	-	1	100
Weekly	1	6,6	12	80,0	1	6,6	1	6,6	15	100
Monthly	1	16,6	4	66,6	-	-	1	16,6	6	100
Sporadically	-	-	6	66,6	2	22,2	1	11,1	9	100
No	-	-	8	72,7	3	27,2	-	-	11	100
Physical Activity										
Yes	1	3,2	23	74,1	5	16,1	2	6,4	31	100
No	1	9,0	7	63,6	2	18,1	1	9,0	11	100

Table 2 – Distribution of the university students studied according to general characteristics and nutritional status. São Paulo, 2020.

Company and living with the family are important conditions for food choices. A study carried out with university adolescents from the Southeast Region of Brazil found different results, with 90% of the students not living with parents and/or relatives, that is, they lived with friends or alone, which may favor the rupture of some habits and the adoption of new lifestyles (VIEIRA et al., 2002).

Regarding lifestyle habits, in this study, 73.8% of the students reported practicing physical activity regularly, a result different from that found by Souza et al., who identified the lack of physical activity in most of the students at the University Center of Maringá, in wich 67% of them were considered sedentary (SOUZA; OLIVE TREE; OLIVEIRA, 2002).

A study carried out with 77 students from a private University in the city of São Paulo, found that half of them (50.83%) did not practice physical activity and among those who did, 34.16% reported frequency between one and three times a week and 15% practiced four times or more a week, with the most practiced physical activities being: weight training (49.6%), walking (8.33%), soccer (7.5%) and running (6.66%) (SANTOS et al., 2014).

In the study carried out in Santos, the students were followed up throughout the first year of the University and an increase in the prevalence of sedentary and insufficiently active young people from 52.7% to 60% was observed in the last evaluation carried out 9 months after entering the undergraduate program.

Alcohol consumption was reported by 69% of the university students in the present study, in agreement with the results of Sinigaglia et al (2024) who observed 70% of students who consumed alcohol when entering academic life.

A study carried out with 5,944 students belonging to the area of Biological Sciences of a public University in the city of São Paulo, showed that alcohol was the substance most used by the students, being consumed by 84.7% of the interviewees (SILVA et al., 2006).

Another study conducted with 101 university students enrolled in the Nutrition, Physiotherapy and Nursing courses of a Higher Education Institution in the State of Goiás, observed that 51.6% of the students reported never consuming alcoholic beverages. When analyzing those who ingested alcoholic beverages, approximately one third of the Physical Therapy students (29.2%) reported consuming alcohol with a frequency of "one to four times a month" (DUARTE; ALMEIDA; MARTINS, 2013).

Regarding tobacco use, in the present study, the vast majority of students, 92.9%, reported not smoking, a result similar to that found by Munhoz et al., who identified that 100% of the students enrolled in the Nutrition course at a private institution of higher education, located in the city of Araçatuba, in the countryside of São Paulo, did not use tobacco (MUNHOZ et al., 2017).

Another study, carried out with 185 students from a public University in the city of Viçosa, identified that smoking was initiated or increased in 6.6% of the students and reduced or abandoned in 2.8% of them after entering the university, but about 54% of the smokers consumed cigarettes daily (VIEIRA et al., 2002).

The higher use of alcohol and tobacco found among university students seems to be related to factors such as living away from their parents and having more free hours on weekdays (SILVA et al, 2006). In the present study, the low use of tobacco and alcohol could be a consequence of the fact that most university students lived with their parents, making them have a better and healthier lifestyle.

Regarding the results of the evaluation of anthropometric data, the present study identified that the mean BMI of the students was within the classification of normal weight (23.1 kg/m2). These results were similar to those of the study by Oliveira and collaborators, with Nutrition students from a

public university in the city of Lagarto, in the northeast Brazil, who pointed out that 71% of the students had normal weight and 22% were overweight (OLIVEIRA et al, 2017).

Another study carried out with 119 university students from a Brazilian private institution observed that most students were eutrophic (71.4%), 21.8% were overweight (16.9% were overweight and 5% were grade I obese) and 6.7% were malnourished (CARAM; LAZARINE, 2013).

A study conducted by Santos et al., with 261 health students, aged between 20 and 25 years, from the Federal University of Pará, observed that the average BMI found was 22.3 kg/m^2 for women and 23.2 kg/m^2 for men, which could, according to the authors, be justified by the young age group and the fact that they belong to the Health Sciences area, tending to be more aware of a healthy lifestyle (SANTOS et al., 2019).

The present study identified that the mean WC (77.0 cm) was within the classification "no risk of metabolic complications associated with obesity". A study carried out with 112 students in the area of Health, from a La Salle University Center, in the city of Canoas, Brazilian south, observed that the mean WC found was 88.61cm for men, therefore, within the range considered normal, without metabolic complications; for women, it was 80.9 cm, which was considered high (GASPARETTO; SILVA, 2012).

Among the limitations of this research, we can mention the reduced number of participants, which was mainly due to the beginning of the COVID-19 pandemic and the need to suspend presential classes due to social isolation. In addition, because of the same reason, it was not possible to accompany students in other evaluations throughout the first year of academic studies.

FINAL CONSIDERATIONS

Most of the university freshmenin the present study were women, with a mean age of 21 years, undergraduate students of the Nutrition course, and 69% lived with their parents. Only 7.1% of the students were smokers and three-quarters were physically active.

In the present study, male students, smokers and sedentary students were the ones who presented a higher frequency of overweight, compared to women, non-smokers and physically active.

We recommend that studies that monitor possible effects of academic life on the nutritional status and health of freshmen be carried out. Additionally, implementing activities to promote healthy dietary habits and sports can reduce future risks of chronic diseases in these young students.

We consider of fundamental importance to monitor incoming university students throughout their academic life to observe the influence of this new pace of life on their eating habits, nutritional status and lifestyle.

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