FREQUENCY OF HEALTHY EATING HABITS AMONG STUDENTS OF A PUBLIC UNIVERSITY IN NORTHEASTERN BRAZIL

Frequência de hábitos alimentares saudáveis entre estudantes de uma universidade pública do Nordeste do Brasil

Frecuencia de hábitos alimentarios saludables de estudiantes de una universidad pública del Noreste de Brasil

Original Article

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ABSTRACT

Objective: The aim of this study was to measure the frequency of healthy eating habits among students of a public university in Northeastern Brazil. **Methods:** This is a cross-sectional population-based study. The sample was randomly composed of 933 undergraduate students of both genders aged 18-35 years. The frequency of healthy eating habits was assessed based on the adherence to the 10 Steps to Healthy Eating proposed by Brazil's Ministry of Health. The frequency of each step was measured through questions compiled from previous publications. **Results:** The steps to the healthy eating with the lowest frequencies of adherence were related to the practice of adding salt to prepared foods (18.6%, n=185) and to the consumption of fruits and vegetables (28.3%, n=281) and foods rich in fat (21.5%, n=213) and sugar (48.9%, n=486). However, there was an adequate consumption of beans (83.8%, n=832) and a prevalence of normal nutritional status of 69.6% (n=691) among the students. None of the interviewees followed all the steps to the healthy eating. The average adherence rate was at least 6 steps. Men and women presented different habits and food preferences. **Conclusion:** The university students presented a low frequency of healthy eating habits due to the high intake of food high in fat and sugar and mainly the low consumption of fruits and vegetables and the practice of adding salt to prepared foods. This may, in turn, predispose them to increased risks of morbidity and mortality from noncommunicable diseases.

Descriptors: Students; Food Habits; Nutritional Status; Guideline Adherence; Health Promotion.

RESUMO

Objetivo: *O objetivo deste estudo foi medir a frequência de hábitos alimentares saudáveis entre estudantes de uma universidade pública do Nordeste do Brasil.* **Métodos:** *Este é um estudo transversal de base populacional. A amostra foi aleatoriamente composta por 993 graduandos, ambos os sexos e idade entre 18 e 35 anos. A frequência de hábitos alimentares saudáveis foi avaliada a partir da adesão aos 10 Passos para a Alimentação Saudável propostos pelo Ministério da Saúde do Brasil. A frequência de cada passo foi coletada por meio de perguntas compiladas a partir de publicações prévias.* **Resultados:** *Os passos da alimentação saudável, que tiveram as menores frequências de adesão, estiveram relacionados à prática de adicionar sal aos alimentos prontos (18,6%, n=185) e ao consumo de frutas e hortaliças (28,3%, n=281) e de alimentos gordurosos (21,5%, n=213) e ricos em açúcar (48,9%, n=486). No entanto, observou-se um adequado consumo de feijão (83,8%, n=832) e a prevalência de estado nutricional eutrófico de 69,6% (n=691) entre os estudantes. Nenhum dos indivíduos entrevistados aderiu a todos os passos da alimentação saudável. A taxa média de adesão foi de, pelo menos, 6 passos. Homens e mulheres apresentaram hábitos e preferências alimentares distintos.* **Conclusão:** *Os estudantes universitários apresentaram baixa frequência de hábitos alimentares saudáveis devido à alta ingestão de alimentos ricos em gordura e açúcar e devido, principalmente, ao baixo consumo de frutas e vegetais e a prática de adição de sal aos alimentos já preparados. Isto pode, por sua vez, predispô-los a um maior risco de morbidade e mortalidade por doenças não transmissíveis.*

Descritores: *Estudantes; Hábitos Alimentares; Estado Nutricional; Fidelidade a Diretrizes; Promoção da Saúde.*

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RESUMEN

Objetivo: *El objetivo del estudio fue medir la frecuencia de hábitos alimentarios saludables entre estudiantes de una universidad pública del noreste de Brasil.* **Métodos:** *Estudio transversal de base poblacional. La muestra fue randomizada y consistió de 933 estudiantes de graduación, de ambos los sexos y edades entre 18 y 35 años. La frecuencia de hábitos alimentarios saludables fue valorada a partir de la adhesión de 10 pasos para la Alimentación Saludable propuesta por el Ministerio de la Salud de Brasil. Se recogió la frecuencia de cada paso a través de cuestiones elaboradas de publicaciones anteriores.* **Resultados:** *Los pasos de la alimentación saludable los cuales tuvieron las más bajas frecuencias de adhesión estuvieron relacionadas con las practicas de la adición de sal en las comidas preparadas (18,6%, n=185) y al consumo de frutas y vegetales (28,3%, n=281) y de las comidas llenas de grasa (21,5%, n=213) y azúcar (48,9%, n=486). Sin embargo, un adecuado consumo de frijoles (83,8%, n=832) y la prevalencia del estado nutricional normal del 69,6% (n=691) fueron observados entre los estudiantes. Ninguno de los individuos entrevistados siguió los pasos de la alimentación saludable. La tasa media de adhesión fue de al menos 6 pasos. Hombres y mujeres han demostrado hábitos distintos y preferencias de comidas.* **Conclusión:** *Los estudiantes universitarios presentaron baja frecuencia de hábitos alimentarios saludables debido a la elevada ingesta de comidas con elevado nivel de grasa y azúcar y, principalmente, al bajo consumo de frutas y vegetables y la práctica de adicción de sal en las comidas preparadas. Eso puede contribuir a la predisposición de riesgos elevados de morbidad y mortalidad por enfermedades no comunicables.*

Descriptores: *Estudiantes; Hábitos Alimenticios; Estado Nutricional; Adhesión a Directriz; Promoción de la Salud.*

INTRODUCTION

Among the behaviors that characterize the lifestyle of a population, eating habits have received global attention[1-3]. The formation of eating habits is influenced by a number of physiological, psychological, sociocultural and economic factors[4]. The typical situations of adolescence and early adulthood, such as the intense biological changes and psychosocial instability, along with the changes arising from becoming a university student could turn these individuals into a vulnerable group with health implications[5].

Undesirable eating practices, physical inactivity, stress, alcohol consumption, and smoking can interfere in the social and physical formation, as well as in the nutritional status and biological vulnerability of young people[5-7]. Some studies have assessed eating habits among university students[8-10] and observed, in most of the cases, a low prevalence of healthy eating habits, high intake of foods high in fat and/or sugar, and low intake of fruits and vegetables.

Studies on eating behavior in the university environment[8,11] revealed the factors that influence the adoption of unhealthy eating habits among students. Some of these factors are: experience in student housing, meal skipping, eating away from home, snacking and fast-food consumption. Poor eating habits would still be influenced by new behaviors and social relations, which suggest evidences of eating compulsion in some students who, due to anxiety, may turn the diet into an "escape from reality" for the situations of physical and mental stress[5]. These practices may contribute to the prevalence of overweight and obesity, which have assumed alarming proportions worldwide[6,12-14].

Brazil, as most developing countries, has defined strategies for the control of noncommunicable diseases (NCDs), such as the promotion of healthy eating habits[15]. One of the actions adopted by the Ministry of Health was the development of 10 Steps to Healthy Eating (Chart 1) as part of the National Plan for the Promotion of Healthy Eating[16], based on the Global Strategy on Diet, Physical Activity and Health by the World Health Organization[17,18].

The adoption of healthy eating habits is associated with the prevention of NCDs and health promotion[17]. University students represent a young adult population for whom the adoption of a healthy lifestyle is extremely important[6,7,19]. In turn, knowing the nutritional status of different population groups is an essential step in promoting healthy lifestyles since it allows the planning of nutritional education programs, as well as guidance and proper management of public policies for health promotion[19]. Therefore, the aim of this study was to measure the frequency of healthy eating habits among students of a Northeastern public university from Brazil.

METHODS

This is a cross-sectional population-based study. The sample was randomly selected and consisted of 993 university students enrolled in the first half of 2011 in the Federal University of Sergipe of both genders aged from 18 to 35 years. Volunteers were recruited in classrooms and hallways of the campus. For the initial screening of the volunteers, self-report of any noncommunicable diseases and physiological conditions such as pregnancy and lactation were considered exclusion criteria.

The sample was calculated taking into account a prevalence rate of 12% of healthy eating habits observed in a previous study[20], a sampling error of 2.3%, significance level of 1% and a population size of 12.241. Thus, a minimum sample of 873 individuals was obtained. Considering a 10% additional for possible losses and refusals, the sample size was determined to bef 993 individuals.

In order to characterize the population, descriptive information were collected: gender, age, academic major, year of study, and school shift (morning and/or afternoon). Questions compiled from a study about the 10 Steps to Healthy Eating proposed by the Ministry of Health[15] were used in the data collection. Chart 1 shows the 10 steps. These questions were applied in a pretest involving 50 individuals in order to perform the necessary adjustments, train the interviewers and thus avoid collecting biased data. All interviewers attended an initial training session before the pretest. During the collection, meetings were held in order to clarify doubts and strengthen the guidance on data collection.

The frequency of food consumption was assessed through students' reports regarding their eating habits in the previous year. The response options were distributed into: less than once/week, once/week, twice or three times/week, four to six times/week and daily. The foods assessed were: fruits and vegetables (step 1), beans (step 2), fatty foods (step 3), high-sugar foods (step 6), soft drinks and alcoholic beverages (step 7).

The other steps related to eating habits and lifestyle were collected through direct questions: "Do you usually add more salt to food served in your plate?" (step 4), "How many meals do you usually have each day?" (step 5); "Do you eat too fast? Do you finish your meals before the others?" (step 8); and "Do you exercise regularly? Do you accumulate 30 minutes of physical activity/day or 150 minutes/week?" (step 10).

Anthropometric data (self-reported weight and height) were used to calculate the Body Mass Index (BMI) and classify the nutritional status (step 9) following the criteria adopted by the World Health Organization[21]. A previous study conducted with a population of adults validates weight and height self-reports[22].

The processing and analysis of the results were performed using the SPSS for Windows, version 20.0. Absolute and relative frequencies of the descriptive variables and of the adherence to the 10 Steps to Healthy Eating were calculated. Continuous variables such as age and BMI were categorized and eating habits were classified as adequate or inadequate according to the steps to healthy eating. Thus, Pearson chi-squared test was used to check for association between the descriptive variables and the adherence/adequacy to the steps to healthy eating. A significance level of 5% was adopted.

In accordance with the principles of the declaration of *Helsinki*, all volunteers were informed about the study protocol and signed the consent form. The research project was approved by the Research Ethics Committee of the Federal University of Sergipe and by the National Health Council (Opinion No. 0064.0.107.000-11).

RESULTS

Table I shows the characteristics of the population. Among the students included in the sample, more than half were freshmen (55.2%, n=548) and had a mean age of 20.23 ± 2.79 years. Most students were enrolled in exact sciences courses (43.2%, n=429), lived in the capital city and surrounding cities (80.0%, n=782) and were at normal weight according to the BMI (70.7%, n=691).

The frequency of adherence to the 10 Steps to Healthy Eating (Chart I) is presented in Table II. Less than 30% of the students (28.3%, n=281) met the minimum recommendation of daily consumption of fruits and vegetables established

Chart I - 10 Steps to Healthy Eating.

STEP 1:	Increase and vary the consumption of fruits and vegetables. Eat them five times a day.
STEP 2:	Eat beans at least once a day, minimum four times a week.
STEP 3:	Reduce the intake of high-fat foods, such as meats with apparent fat, sausage, bologna, fried and salty food, to once a week.
STEP 4:	Reduce the consumption of salt. Remove the salt shaker from the table.
STEP 5:	Have at least three meals and one snack per day. Do not skip meals.
STEP 6:	Reduce the intake of candies, cakes, cookies, and other high-sugar foods to twice a week.
STEP 7:	Reduce the intake of alcohol and soft drinks. Avoid their daily consumption.
STEP 8:	Enjoy your meal. Eat slowly.
STEP 9:	Keep your weight within healthy limits – consult the health service in order to check if your BMI (body mass index) is between 18.5 and 24.9 kg/m^2.
STEP 10:	Be active. Accumulate thirty minutes of physical activity every day. Walk around your neighborhood. Climb stairs. Do not spend many hours watching TV.

Table I - Characteristics of the population. Sergipe, Brazil, 2011 (n=933).

Variable	n	%
Gender		
Men	544	54.8
Women	449	45.2
Age (years)		
≤ 19	545	54.9
20-24	366	36.9
≥ 25	82	8.3
Place of Residence (n=977)		
Capital city and surrounding cities	782	80.0
Other cities	195	20.0
Field of study (n=992)		
Exact sciences	429	43.2
Biological and health sciences	200	20.2
Agricultural sciences	163	16.4
Social and human sciences	200	20.2
Year of study		
First year*	548	55.2
Intermediate	359	36.2
Last year**	86	8.7
Number of daily meals		
< 4	270	27.2
≥ 4	723	72.8
Body mass index (kg/m²) (n=978)		
Underweight (<18.5)	108	11.0
Normal (18.5-24.9)	691	70.7
Overweight (25.0-29.9)	150	15.3
Obesity (≥30.0)	29	3.0

n: absolute frequency. %: relative frequency. *students in the 1st and 2nd semesters. **students from 7th semester.

by the Ministry of Health (step 1). On the other hand, the consumption of beans (step 2) presented high adequacy among most of the students (83.8%, n=832), especially among men (p<0.001). The adherence to step 1 was associated with a greater number of meals (Table III).

The findings related to foods high in sugar (step 6) revealed that less than half of the students (48.9%, n=486) meet the recommendation of up to twice a week. The adequate consumption of fatty foods (step 3) was also not a priority on the part of most students (21.5%, n=213). Gender was directly associated with the adherence to these steps. While the consumption of foods high in sugar was adequate among men (p<0.001), the consumption of fatty foods was more adequate among women (p=0.015). Still, step 6 was associated with an increase in age (Table III).

The step with the lowest rate (18.6%, n=185) was the one related to adding salt to already prepared meals, which is represented by the habit of taking the salt shaker to the table (step 4). The highest adequacy (98.1%, n=974), on the other hand, corresponded to the consumption of alcohol and soft drinks (step 7). Men presented a greater adequacy to the step 7 (p=0.012).

The recommendations of the Ministry of Health to have three daily meals and a snack (step 5) and eat slowly (step 8) were respectively reported by 64.2% (n=638) and 50.4% (n=500) of the respondents. The findings related to these steps were associated with nutritional status, age, and gender (Table III).

A significant portion of the population (69.6%, n=691) was normal according to the nutritional status (step 9). However, less than half (42.3%, n=420) reported exercising at least 30 minutes per day (step 10). Gender was directly associated with the following steps: predominance of normal weight among women (p=0.01) and regular physical activity among men (p<0.001). Still, step 10 was associated with the increase in body weight (Table III).

No significant associations were found regarding the adherence to the 10 steps when comparing each field of study. It is important to highlight that none of the interviewees followed all the steps to healthy eating, but there was an average of at least 6 steps.

Table II - Frequency of adherence to the 10 Steps to Healthy Eating among university students. Sergipe, Brazil, 2011 (n=933).

10 Steps to Healthy Eating	n	%
Step 1: daily consumption of fruits, legumes and vegetables	281	28.3
Step 2: consumption of beans at least once a day, minimum four times per week	832	83.8
Step 3: consumption of high-fat foods no more than once a week	213	21.5
Step 4: not adding salt to prepared meals	185	18.6
Step 5: three meals and one snack per day	638	64.2
Step 6: consumption of candies, cakes, cookies, and other high-sugar foods twice a week	486	48.9
Step 7: avoid the daily consumption of alcohol and soft drinks	974	98.1
Step 8: eat slowly	500	50.4
Step 9: keep the weight within healthy limits - consult the health service in order to check if your BMI is between 18.5 and 24.9 kg/m^2	691	69.6
Step 10: accumulate thirty minutes of physical activity every day	420	42.3
All the steps	0	0.0

n: absolute frequency. %: relative frequency. BMI: Body Mass Index.

Table III - Frequency of adherence to the 10 Steps to Healthy Eating among university students according to descriptive variables. Sergipe, Brazil, 2011 (n=993).

Variables	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8	Step 9	Step 10
Gender*	**0.091**	**<0.001**	**0.015**	**0.229**	**0.096**	**<0.001**	**0.012**	**<0.001**	**0.010**	**<0.001**
Male	26.1	87.7	18.6	17.3	61.9	54.2	99.1	43.6	66.2	53.3
Female	31.0	79.1	24.9	20.3	67.0	42.5	96.9	58.6	73.7	29.0
Age (years)*	**0.470**	**0.398**	**0.384**	**0.391**	**<0.001**	**0.036**	**0.861**	**0.239**	**0.113**	**0.461**
≤ 19	27.7	83.5	21.7	19.1	69.4	45.3	98.0	51.9	71.7	41.8
20-24	27.9	85.2	19.9	16.9	58.2	52.7	98.4	47.0	68.3	41.5
≥ 25	34.1	79.3	26.8	23.2	57.3	56.1	97.6	54.9	61.0	48.8
Year of study*	**0.267**	**0.698**	**0.124**	**0.146**	**0.008**	**0.365**	**0.348**	**0.029**	**0.503**	**0.198**
First year	30.3	83.2	22.4	19.9	69.2	47.1	97.1	52.2	71.0	40.3
Last year	24.4	84.9	15.1	26.7	54.7	52.3	98.8	39.5	67.4	47.7
Number of daily meals*	**0.034**	**0.667**	**0.169**	**0.389**	**<0.001**	**0.002**	**0.931**	**0.023**	**0.065**	**0.237**
< 4	23.3	83.0	18.5	20.4	0.0	57.0	98.1	44.4	65.2	39.3
≥ 4	30.2	84.1	22.5	18.0	88.2	45.9	98.1	52.6	71.2	43.4
Body mass index (kg/m^2)*	**0.345**	**0.663**	**0.590**	**0.357**	**0.023**	**0.651**	**0.303**	**<0.001**	**<0.001**	**<0.001**
Underweight (< 18.5)	25.0	85.2	24.1	15.7	69.4	43.5	96.3	63.9	0.0	28.7
Normal (18.5-24.9)	28.9	83.8	21.9	19.7	66.0	49.2	98.0	52.1	100.0	42.5
Overweight (25.0-29.9)	26.7	84.7	19.3	14.7	58.0	51.3	99.3	36.7	0.0	53.3
Obesity (≥ 30.0)	41.4	75.9	13.8	24.1	44.8	48.3	100.0	34.5	0.0	41.4

* *p*-value, chi-square test.

DISCUSSION

University students represent a young adult population to whom it is extremely important the development of nutritional guidelines that favor the adoption of a healthy lifestyle[6,7,19]. Individuals in this age group are susceptible to the development and consolidation of lifestyles, which, if not healthy, will determine a favorable risk pattern in the context of morbidity and mortality from NCDs[5,23].

However, studies reporting the frequency of eating habits among university students are limited, especially in Northeastern Brazil. It is still not established whether universities have a positive influence on behaviors related to the adoption of eating habits and healthy lifestyle by young adults in an educational environment. Therefore, further studies are necessary in order to support the development and implementation of effective strategies for health promotion in this group.

The population of the present study is representative of the students of a public university in Brazil. We believe that the representativeness of the size and gender distribution of the sample have contributed to a reliable measurement of the frequency of healthy eating habits in this university population.

Among the findings of the present study, the inadequate consumption of fruits and vegetables should be highlighted. Considering that the intake of this food group has a protective effect against various types of cancer and other NCDs[17], the fact that less than 30% of the population eats fruits and vegetables on a daily basis is relevant (step 1). Other studies confirm this finding when it comes to university students[3,8-10,24]. This result may be associated with the habit of eating out and the low adherence to healthy food consumption given that these foods are not often part of the menu of cafeterias in the university campus.

The adherence to the step 1 was associated with the habit of eating at least three meals and one snack a day (step 5). This association indicates the healthy habit of eating fruits before meals, which contributes to prevent diseases[25] and increase the efficiency of the regulatory mechanisms of hunger and satiety, promoting the reduction of energy intake at the next meal[26].

Adequate consumption of beans (step 2) was reported by many students and is ratified by the last Consumer Expenditure Survey (*Pesquisa de Orçamentos Familiares – POF*) that indicates beans as one of the most consumed foods in Brazil[12]. Higher consumption of beans among men was similarly found in other studies[9,15]. The consumption of fiber-rich foods, such as beans, contributes to a diet low in fat and cholesterol and high in protective nutrients, such as unsaturated fatty acids, folic acid, minerals and antioxidant vitamins[27].

The low adherence to the adequate consumption of foods high in fat and sugar (step 3 and 6) found in the present study represents an unfavorable trend in dietary pattern, especially in terms of obesity, diabetes, some types of cancer and other noncommunicable diseases associated with diets with high energy density and low content of fiber and micronutrients[17,28,29]. The adherence to these steps was also associated with gender and increasing age. While men were more adequate to the consumption of foods high in sugar, women were more adequate to the consumption of fatty food. Previous studies found similar behaviors in Brazilian[9] and European university students[30]. However, a study involving American young adults of European and African origins revealed a higher fat intake among women[4].

Among the Steps to Healthy Eating, the practice of not adding salt to already prepared meals (step 4) was the step that showed the lowest frequency of adequacy. This result is verified in the consumption of the Brazilian population, which is characterized by largely exceeding the maximum recommendation of 2g of sodium (5g of salt) per person/day[17]. Excessive salt intake is directly associated with hypertension, contributing to the development of cardiovascular diseases[31].

The highest adequacy was related to the consumption of alcohol and soft drinks (step 7), especially among men. By analyzing solely the drinks, through data not shown in table, it was found that the consumption of alcohol and soft drinks presented an adequacy rate of 98.9 and 85.6%, respectively. This result contradicts the findings of other studies, which point out a high intake of alcohol and soft drinks among young adults, especially men[2,4,9,32]. The cutoff point proposed by the Ministry of Health (only avoid daily consumption of these beverages, i.e., seven times/week) and adopted in the study partially justifies the finding on low intake of alcohol and soft drinks. However, a previous study with students of the same university also found a low alcohol consumption[9].

Regarding the recommendations to have three daily meals and a snack (step 5) and eat slowly (step 8), it was observed a lower adherence among overweight students and those who are about to complete their course. The university routine, especially during the last year of study, is characterized by the lack of time, which in stressful situations leads the student to skipping meals and/or replacing it with quick snacks of low nutritional quality foods[8,11]. This inadequacy is relevant given its prevalence among overweight individuals; in addition, both recommendations – having a greater number of meals and thoroughly chewing food – allow a greater regulation of the neuroendocrine axes that control hunger and satiety[33].

The prevalence of normal nutritional status (step 9) found in the present study is contradictory to the findings of the last POF, which has diagnosed a substantial increase in the prevalence of overweight and obesity in the Brazilian population over 20 years old since the 70s[12]. On the other hand, underweight was higher among university students compared to the Brazilian population (Table I). Women are significantly more adequate than men in relation to nutritional status. Studies with university students confirm this finding and relate it to the fact that women demonstrate greater concern with the body, maintaining and/or losing weight[2,34].

The recommendation to accumulate 30 minutes of physical activity daily (step 10) was followed by less than half of the students. According to a study conducted with Brazilian university students[35], the low prevalence of physical activity may be associated with the academic profile of the student (year of entry, school shift, and number of hours on campus), economic characteristics (income, social class, and who the student lives with) and lifestyle (following or not following a diet). Still regarding step 10, it was observed a higher frequency of adherence among men and overweight students. The association between physical activity and overweight is very positive as the

habit of exercising contributes to weight loss, prevention and treatment of NCDs, and reduction of morbidities throughout life[36].

It is worth mentioning that being in the last year of university did not lead students to a higher adherence to the Steps to Healthy Eating. This behavior highlights the role of the University in the dissemination of knowledge, cultures and values among which health practices could not be excluded. Given this context, it is verified the need for developing and implementing strategies and public policies that are effective in promoting health and improving the quality of life in the university community.

CONCLUSION

The university students presented a low frequency of healthy eating habits due to the high intake of food high in fat and sugar and mainly due to the low consumption of fruits and vegetables and the practice of adding salt to already prepared food. This may, in turn, predispose them to increased risks of morbidity and mortality from noncommunicable diseases.

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