

# Assessment of Food Choices of University Students in Southwest Bahia



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## Abstract

**Objective:** to assess the food choices of university students through the Food Choice Questionnaire, translated and validated for the Portuguese language.

**Method:** This is a quantitative and descriptive study, carried out with 397 university students. For data collection, the food choices questionnaire was used, consisting of 36 items corresponding to 9 factors, in which individuals attributed, on a scale 1 to 4, the importance of the items in relation to the factors.

**Result:** it was possible to observe that factors: "price", "health", "sensory appeal", and "convenience" were the most important factors for the students' food choices.

**Conclusion:** The study allowed understanding of the food choices of university students, noting that they tend to choose healthy foods but still give high importance to the sensory appeal and the price of food, which often leads to unhealthy food choices.

**Keywords:** Diet; Food consumption; Nutrients

**Abbreviations:** CND: Chronic Non-Communicable Diseases; SPSS: Statistical Package for Social Sciences; FCQ: Food Choice Questionnaire

## Introduction

Choosing food well is a crucial factor for a good quality of life, since the consumption of foods with high levels of fat, salt and sugar associated with lack of regular physical activity and excessive alcohol consumption can trigger chronic non-communicable diseases (CND), a current public health problem [1].

The study on the food choices of individuals has gained attention, as in the research carried out by Golley et al. [2] who verified, through valid and reliable questions, the behavior of adolescents towards the ingestion of food groups. Howse et al. [3], in turn, showed a positive perception and experience of young adults with respect to food.

The growing research that assesses food choices considers the factors that can influence this process. According to Brazil et al. [4], the sensory nature of food as well as its market value and the consumer income are factors that directly influence these decisions. Furthermore, in their research, Gao, Matilla [5] noticed that women tend to change their food choices at the time of purchase when they are accompanied by men. Vilaro et al. [6] observed that social media such as Instagram and Pinterest also directly influence people's daily diet plans.

There are numerous methods used to assess food choices and, among them, the Food Choice Questionnaire (FCQ) stands out, a method widely used in several countries, but little in Brazil.

Several authors have used this method in different countries, such as Milošević et al. [7] in 6 Western Balkan countries, Cabral et al. [8] in Africa, and Pearcey, Zhan [9] in China. In Brazil, the translation and validation of the method was made by Diniz et al. [10], who adapted the FCQ to the Portuguese language.

The change in life that university students experience when entering the academic field is highlighted in the studies carried out by Feitosa & Duarte et al. [11,12]. These authors mentioned the need for the students to live far from their family, live in republics or alone. This new housing arrangements and the busy schedule causes changes in the eating routine, particularly for lack of time to prepare food. According to Fulkerson [13], fast food is a quick alternative, as they are ready-made snacks, and this contributes to a poor quality and unhealthy diet among young people and adults.

Considering the reports in the literature on the food choices of individuals and the importance of understanding eating habits, there is a need to assess the food choices of university students in order to verify how the change in the routine of this population can influence this process. Therefore, the objective of the present study was to evaluate the food choices of university students through the FCQ translated and validated to Portuguese.

## Materials and Methods

### Types of study

This study is classified as quantitative and descriptive with a cross-sectional approach.

#### Study site

The tests were carried out in the classrooms and outdoors of the State University of Southwest Bahia (UESB), Jequié campus.

### Population and sample

The population for the research was selected using a convenience (non-probabilistic, intentional) sample composed of university students aged between 18 and 42 years. The selection of participants was performed through a sample calculation based on the total number of students enrolled in the Jequié campus of the UESB (3260 students) during 2018, totaling 344 participants required for the study.

**Inclusion and exclusion criteria:** Female and male students from the State University of Southwest Bahia, from the Jequié campus, Bahia were included. Research participants were invited to participate voluntarily and, upon accepting, the tests were performed after signing the Informed Consent Form - ICF (Appendix A). Individuals under the age of 18 and not enrolled in the Jequié campus of the UESB were excluded.

### Research instruments and techniques

**Food choice questionnaire:** According to Streptoe, Pollard [14], the FCQ is a self-applicable tool consisting of 36 items that are distributed into nine factors, or extensions, aimed at assessing aspects related to food choices, as explained in Table 1 (ANNEX A).

Thus, the FCQ validated by Diniz et al. [10] was used to assess food choices, in which the participants judged aspects related to food, such as: health, mood, convenience, sensory aspects of food, price, familiarity, concern with body weight, among others.

**Table 1:** Sociodemographic and attitude information.

Variables	n (%)
<b>Sex</b>	
Female	298 (74.5)
Male	99 (24.8)
<b>Color</b>	
Yellow	7 (1.8)
White	77 (19.3)
Brown	205 (51.3)
Black	104 (26.0)
Indigenous	4 (1.0)
<b>Marital Status</b>	
Single	339 (84.8)
Married	41 (10.3)
Divorced	4 (1.0)
Others	13 (3.3)
<b>Family Income (BRL)</b>	
Up to 724.00	28 (7.0)
724.00 to 1,500.00	160 (40.0)
1,500.00 to 3,000.00	124 (31.0)
3,000.00 to 5,000.00	59 (14.8)
> 5,000.00	26 (6.5)
<b>Physical Activity</b>	
Yes	172 (43.0)
No	225 (56.3)
<b>Use Of Medications</b>	
Yes	95 (23.8)
No	302 (75.5)
<b>Religion</b>	
Catholic	183 (45.8)
Protestant	108 (27.0)
Adventist	12 (3.0)
Spiritist	7 (1.8)
Others	87 (21.8)

Source: Direct Research.

The respondents were asked to think about the statement: "It is important to me that the food I eat on a typical day...", and then indicate, through the factors shown, which were the items they thought be more meaningful to define their food choice. To obtain the answer on preferences, the alternatives were presented in a four-point Likert scale: 1 (not important); 2 (somewhat important); 3 (moderately important) and 4 (very important);

the higher the score indicated by the participant, the greater the importance given to this particular factor. Thus, at the end of the test, a score was generated and through this score the mean for each FCQ factor was calculated, making it possible to understand, through the highest scores, which were the factors that the participants judged most important to them.

**Personal information, sociodemographic and behavioral characteristics:** A structured questionnaire (ANNEX B) was applied in order to characterize the study population. The information collected from the questionnaire referred to sociodemographic characteristics and attitudes (sex, age, race/color, marital status, religion, family income, physical activity, and use of medications).

**Statistical analysis:** Frequency analyses were performed for the semi-structured questionnaire on personal and sociodemographic information and for the food choices questionnaire, descriptive analyses were performed. To analyze the results obtained through the food choices questionnaire, an analysis of the reliability of the FCQ was generated using Cronbach's alpha, according to Cardoso, Vale [15]. After that, the descriptive analysis of the data obtained for each FCQ factor was considered, according to the Likert-Cohen scale, by Diniz et al. [10], for the categorization from 1 to 4 points, where 1 corresponded to no important; 2 a little important; 3 moderately important, and 4 very important. Thus, a score was generated and the mean was calculated for each factor in the questionnaire; higher scores suggest the factor has a greater importance to the participant. After that, an ANOVA followed by Bonferroni test was performed to compare means and, finally, sexes and age groups were compared. The Statistical Package for Social Sciences (SPSS), version 21, was used for all statistical analysis of the data.

**Ethics in research:** The research was conducted according to the ethical issues described in Resolution number 466/12 of the National Health Council, and the study was submitted for consideration by the Research Ethics Committee of the State University of Southwest Bahia, under protocol 90227018.9.0000.0055 and approved under opinion number 2,783,597. Thus, data collection was started after authorization from the UESB Ethics Committee, and the research participants voluntarily participated, after signing the informed consent form.

## Results and Discussion

The sample consisted of 397 university students (298 women [74.5%]; 99 men [24.8%]) who participated in the study, aged between 18 and 42 years, with a mean of 23 ± 4.1 years, most of whom were single. The present study had a predominance of female students aged between 18 and 42 years, similar to other studies carried out with university populations [16]. As for lifestyle, it was observed that the majority reported not practicing physical activity or taking continuous medication. Table 1 shows the characteristics of the studied population, describing sociodemographic and attitude information.

As for economic aspects, it was possible to verify that 40% of the interviewees had a family income below two minimum wages, collaborating with the study carried out by Defante [17], which characterized families that have a purchasing power of up to two minimum wages, as families of low-income and classified as level E. The socioeconomic profile may, therefore, be related to the eating behavior of the individuals. The reliability of the FCQ was assessed through an analysis of internal consistency using Cronbach's alpha coefficient, according to Cardoso & Vale [15], as shown in Table 2.

**Table 2:** Internal consistency of the FCQ and total score for the sample of university students (N=397).

Factor	Number of Items	Cronbach's Alpha
Health	6	0.839
Mood	6	0.827
Convenience	5	0.829
Sensory appeal	4	0.705
Natural content	3	0.773
Price	3	0.658
Weight control	2	0.786
Familiarity	3	0.757
Ethical concerns	3	0.812

Source: Direct Research.

The Cronbach's alpha coefficient is a consistent method, which measures the estimate of the items in a questionnaire in relation to an unweighted sum, which can be interpreted on a scale with variance between 0 to 1. Regarding the reliability of a test, the ideal alpha ( $\alpha$ ) value range is at least from 0.70 to 0.82, and the  $\alpha$  value of 0.6018 is considered acceptable. The factors presented Cronbach's alpha values ranging from 0.658 (price factor) to 0.839 (health factor) as shown in Table 2 [18].

Comparing these results, it is possible to see that, with regard to the factors "natural content", "sensory appeal", "convenience", "familiarity" and "health", the  $\alpha$  results are superior to those found in the study by Loubera & Rios [19]. In addition to the dimensions mentioned, another study carried out by Fotopoulos et al. [20] found lower results for factors such as "mood" and "ethical concern" in relation to those found in the present study.

In this sense, considering the reliability of the FCQ, it is possible to affirm that the data obtained are reliable. This means that the FCQ's ability to positively analyze the factors that influence food choices is confirmed.

**Table 3:** Descriptive analysis of the FCQ dimensions applied to university students.

Factor	Mean	Standard Deviation (±)
Health	3.33	0.61
Mood	3.19	0.69
Convenience	3.34	0.68
Sensory appeal	3.55	0.52
Natural content	3.02	0.789
Price	3.48	0.59
Weight control	2.87	0.97
Familiarity	2.83	0.8
Ethical concerns	2.28	0.96

Source: Direct Research.

A descriptive analysis of the data obtained for each FCQ factor (mean and standard deviation) was performed (Table 3), and it was possible to observe that the factors “sensory appeal” (M=3.55; SD= ± 0.52), “price” (M=3.48; SD= ± 0.59) and “convenience” (M=3.34; SD= ± 0.68) had the highest mean values for university students, and the factor “ethical concerns” (M=2.28; SD= ± 0.69) was the one with the lowest mean value of importance.

Pollard et al. [21] obtained, in relation to the factors found in the present study, the following means in greater predominance: “Sensory appeal” = 2.99; “price” = 2.83; and “convenience” = 2.75. Pearcey, Zhan9 had the result of 3.05 for “Sensory appeal”; 3.10 for “price”. They also had 1.75 as lower value for “ethical concern” in relation to the other factors. Thus, the values obtained in this study were higher than those found by the cited authors.

In the ANOVA followed by the Bonferroni test, considering statistical significance when  $p < 0.05$ , it was possible to observe that there was a significant difference between groups, with the factor “sensory appeal” statistically different when compared to the others except from “price”. The factor “ethical concerns” showed a significant difference when compared to all other factors evaluated in the FCQ.

Thus, the sample population characterized “sensory appeal”, followed by “price” and “convenience” as the most important factors. This means that, for the university students, the taste of food matters more, and other necessary aspects were that the food had to be of low price and practical, of quick and simple preparation. The least important factor was “ethical concerns”, revealing that research participants did not usually take this aspect into account in the process of choosing.

Lambert et al. [22] noticed in their study with university students that, due to the high cost of healthy foods compared to unhealthy ones, as well as the way and time of food preparation, the evaluated participants had unhealthy eating habits. Likewise, Wernik [23] stated that students change a healthy life style and start snacks that are rich in fats, salt and sugar at the university.

Descriptive analysis and ANOVA were performed to compare means in order to compare the results obtained between sexes

(female and male) (Table 4), and it was possible to observe that only the weight control factor showed a significant difference between sexes, where females attributed greater importance to weight control in food choices, when compared to males.

**Table 4:** Descriptive analysis of the FCQ dimensions in relation to sex.

Factor	Sex	Mean (± SD)	ANOVA (p<0.05)
Health	Female	3.35 (±0.58)	0.605
	Male	3.27 (±0.67)	
Mood	Female	3.24(±0.67)	0.058
	Male	3.06 (±0.73)	
Convenience	Female	3.37 (±0.68)	0.349
	Male	3.23 (±0.69)	
Sensory appeal	Female	3.56 (±0.53)	0.427
	Male	3.49 (±0.51)	
Natural content	Female	3.02 (±0.79)	0.67
	Male	3.01 (±0.79)	
Price	Female	3.49 (±0.59)	0.822
	Male	3.46 (±0.60)	
Weight control	Female	2.95 (±0.94)	0.02
	Male	2.64 (±1.03)	
Familiarity	Female	2.87 (±0.79)	0.171
	Male	2.71 (±0.83)	
Ethical concerns	Female	2.30 (±0.93)	0.713
	Male	2.20 (±1.03)	

Source: Direct Research.

A study by Porto & Czeglédi [24,25] observed that dissatisfaction with body image and weight control are particular issues of women when compared to men, highlighting that this dissatisfaction may be due to the demand they suffer from society and the media so that they have a slim and perfect body. Likewise, Min et al. [26] in their study highlighted that, in addition to the concern with weight control that females have, the need for a perfect body also considers healthy eating and regular physical activity that leads to a reduction in overweight/obesity in women when compared to men. Thus, the highlighted studies are concurrent with the results obtained in this study.

A descriptive analysis was performed followed by ANOVA to compare the FCQ dimensions in relation to age groups, stratifying by age group from 18 to 30 years and 31 to 42 years. There was a significant difference between the age groups for the factors “health”; “weight control”; and “natural content”. Thus, individuals between 31 and 42 years of age are more concerned with the factors “health”, “weight control” and “natural content” when compared to individuals between 18 and 30 years of age. This result reveals that older individuals are more concerned with factors that are directly related to healthy food choices, when compared to younger individuals.

**Table 5:** Descriptive analysis of FCQ dimensions in relation to age

group (18 to 30 years and 31 to 42 years).

Factor	Age group	Mean ( $\pm$ SD)	ANOVA ( $p < 0.05$ )
Health	18 a 30 years	3.31 ( $\pm 0.61$ )	0.008
	31 a 42 years	3.63 ( $\pm 0.51$ )	
Mood	18 a 30 years	3.19 ( $\pm 0.69$ )	0.291
	31 a 42 years	3.33 ( $\pm 0.70$ )	
Convenience	18 a 30 years	3.34 ( $\pm 0.68$ )	0.974
	31 a 42 years	3.33 ( $\pm 0.77$ )	
Sensory appeal	18 a 30 years	3.55 ( $\pm 0.53$ )	0.901
	31 a 42 years	3.54 ( $\pm 0.48$ )	
Natural content	18 a 30 years	2.99 ( $\pm 0.79$ )	0.004
	31 a 42 years	3.44 ( $\pm 0.63$ )	
Price	18 a 30 years	3.48 ( $\pm 0.59$ )	0.45
	31 a 42 years	3.57 ( $\pm 0.63$ )	
Weight control	18 a 30 years	2.83 ( $\pm 0.98$ )	0.008
	31 a 42 years	3.35 ( $\pm 0.72$ )	
Familiarity	18 a 30 years	2.83 ( $\pm 0.80$ )	0.761
	31 a 42 years	2.88 ( $\pm 0.85$ )	
Ethical concerns	18 a 30 years	2.27 ( $\pm 0.95$ )	0.208
	31 a 42 years	2.51 ( $\pm 0.97$ )	

Source: Direct Research.

A similar result was found by Howse et al. [3], who evaluated the food choices of people aged between 18 and 24 years and between 25 and 30 years, noting that individuals aged 18 to 24 years had unhealthy food choices in relation to more mature individuals. The study also showed that the fact that foods beneficial to health have a high price in the market makes people not to choose these foods in daily life, and switch to unhealthy foods.

Similarly for Cardoso, when comparing the age groups from 18 to 25 years and from 26 to 35 years, Vale15 stated that older people are more concerned about their health, considering the factor “natural content” of food and thus showing similarity with the present study. It is noteworthy that there was a scarcity of studies using the FCQ with university students, as well as a small number of researches regarding the development of adapted and effective intervention programs to improve the eating behaviors of university students.

### Conclusion

Through this study, it was possible to verify that despite assigning moderate importance to the health factor in food choices, the individuals evaluated were more concerned with the sensory appeal, price and convenience to guide them in this process, which can often lead to less healthy choices. In this sense, it is necessary to develop health promotion strategies in the university environment in order to instruct students to seek healthy eating habits, aiming at a better quality of life.

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