

*Influência da qualidade da dieta no estado nutricional de escolares do município de
Fortaleza-CE.*

**Influence of diet quality on the nutritional status of schoolchildren in the city of
Fortaleza-CE.**

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Resumo:

O excesso de peso em escolares aumentou nos últimos anos, sendo a alimentação um fator para este problema. E conhecer a qualidade da alimentação é essencial para prevenir os desfechos na saúde futuramente. O objetivo do estudo foi investigar a associação entre a qualidade da dieta e o estado nutricional de escolares brasileiros. O estudo tem caráter transversal observacional, de abordagem quantitativa. Foram avaliados peso corporal, estatura e circunferência da cintura. O estado nutricional foi determinado com o Índice de Massa Corporal e Circunferência da Cintura. O consumo alimentar foi coletado pelo Questionário de Frequência Alimentar e avaliado pelo Índice de Alimentação Escolar. A análise das variáveis foi realizada pelos testes T de Student, Mann-Whitney e Qui-quadrado de Pearson. Uma amostra final de 809 escolares, com idade de 12 anos (DP=1,94), com maioria no sexo feminino (55,5%) foi estudada, com 58,34% de Índice de Massa Corporal na faixa eutrófica e com 90,36% sem risco cardiometabólico. O consumo diário do feijão ($p=0,027$) para sexo masculino e as verduras ($p=0,005$) e leite ($p=0,03$) para o sexo feminino, apresentaram associação significativa com o estado nutricional. Os alimentos não recomendados apresentaram associações significativas, como refrigerantes ($p<0,001$), hambúrguer ($p=0,041$), fritura ($p=0,005$), maionese ($p=0,035$), macarrão instantâneo ($p=0,001$). Conclui-se que a maioria dos escolares estudados são eutróficos com baixo risco cardiometabólico, não havendo associação entre o estado nutricional com a qualidade da dieta.

Palavras-chave: Estado nutricional; Escolares; Obesidade; Escolas.

Abstract:

Overweight in schoolchildren has increased in recent years, and diet is a factor in this problem. Knowing the quality of the diet is essential to prevent health outcomes in the future. The aim of this study was to investigate the association between diet quality and the nutritional status of Brazilian schoolchildren. This is an observational cross-sectional study with a quantitative approach. Body weight, height and waist circumference were assessed. Nutritional status was determined using the Body Mass Index and Waist Circumference. Food consumption was collected using the Food Frequency Questionnaire and assessed using the School Feeding Index. The variables were analyzed using Student's t-test, Mann-Whitney test and Pearson's chi-square test. A final sample of 809 schoolchildren, aged 12 years (SD=1.94), with the majority in females (55.5%) was studied, with a Body Mass Index of 58.34% in the eutrophic range and 90.36% with no cardiometabolic risk. Daily consumption of beans ($p=0.027$) for males and vegetables ($p=0.005$) and milk ($p=0.03$) for females showed a significant association with nutritional status. Non-recommended foods showed significant associations, such as soft drinks ($p<0.001$), hamburgers ($p=0.041$), fried foods ($p=0.005$), mayonnaise ($p=0.035$) and instant noodles ($p=0.001$). It can be concluded that most of the schoolchildren studied are eutrophic with low cardiometabolic risk, and there was no association between nutritional status and diet quality.

Keywords: Nutritional status; Students; Obesity; Schools.

1. Introduction

According to the World Health Organization (WHO), childhood corresponds to the phase in which the individual is between 2- and 9-years old and adolescence is the period of transition from childhood to adulthood from 10 to 19 years old. It is in childhood that people begin to develop the autonomy to decide what they want to eat, and in adolescence to establish behavioral patterns related to food, physical activity and other aspects that affect health (IRALA; FERNANDEZ, 2001; WORLD ORGANIZATION HEALTH, 1995).

The physiological and metabolic changes that occur during childhood and adolescence can lead to an increase in the consumption of nutrients and calories needed for healthy development and growth (MAICHAKI; BUENO; NOVELO, 2014). It is also observed that during these stages of life, individuals often prefer foods high in refined carbohydrates and fats (JOHANNSEN; JOHANNSEN; BONNY, 2012).

According to Rugani (2022), there is a tendency for excess weight in children and adolescents to increase. Data from the Food and Nutrition Surveillance System (SISVAN) between 2008 and 2022 shows the prevalence of obesity in children aged between 5 and 10 increased from 10.45% to 15.81%, while among adolescents this increase was even more significant, from 4.21% to 12.32% (BRAZIL, 2022).

In addition, excess weight established in childhood or adolescence can persist in adulthood and increase the risk of developing chronic non-communicable diseases (NCDs) (Desiderata, 2019). In this way, healthy eating behaviors started in childhood and reinforced in adolescence are crucial for a healthy life and for preventing NCDs in adulthood (SÁ; MOURA, 2011).

According to Kranz *et al.* (2006), the use of indices is recommended to assess the quality of food, as they are based on specific nutritional recommendations. In addition to making, it possible to carry out a global assessment and to learn about dietary characteristics in a single measure (KANT, 1996).

In Brazil, several questionnaires and indices have already been adapted and validated to assess diet quality in the Brazilian population, such as the Diet Quality Index Revised (DQI-R). This index has already been validated for the Brazilian population (ANDRADE *et al.*, 2013), however no index has yet been proposed to assess the quality of children's diets as has been done in other countries (SERRA-MAJEM *et al.*, 2004).

It is therefore important to evaluate diet quality and its relationship with the nutritional status of children and adolescents, considering that inadequate nutrient intake and excess weight can influence the development of unfavorable health and nutritional outcomes, such as the onset of NCDs. The aim of this study was to investigate the association between diet quality and the nutritional status of schoolchildren.

2. Materials and Methods

2.1 Study design and participants

This study was based on the ENSCA-FOR (Study of Nutrition and Health in Children and Adolescents in the city of Fortaleza), a cross-sectional observational study with a quantitative approach, in schoolchildren aged between 7 and 18 years who were regularly enrolled in public elementary schools in the city of Fortaleza-CE, between 2018 and 2022.

2.2 Research Environment

The public schools in the Fortaleza-CE municipal network are linked to the Regional Executive Secretariats (SER) and the Regional Executive Secretariat for the Center of Fortaleza (SERCEFOR), covering 119 neighborhoods. According to the 2018 School Census, there are a total of 154,331 students enrolled in these schools between the ages of 5 and 18 (BRAZIL, 2018).

To estimate the sample size, the formula for an infinite population was applied considering a conglomerate sampling plan in stages and selection with probability proportional to a size measure (MIOT, 2011).

Using a sampling error of 5%, a confidence level of 95%, an expected estimate of overweight of 50% to maximize the sample size, an estimate of the effect of the cluster design of 3.5 and a possible loss of 10%, a total of 1,483 students were obtained. This sample was distributed proportionally between the regions and the number of existing schools for convenience.

2.3 Data collection

Anthropometric data was collected by trained researchers, who measured body weight, height and abdominal circumference. To collect weight and height data, participants were assessed following the recommendations by Gordon, Chumlea and Roche (1988).

Weight was measured on a Seca® portable electronic scale with a capacity of up to 150 kg and height was obtained using a Sanny® portable stadiometer with a range of 200 cm. The two measurements followed the SISVAN methodology (BRAZIL, 2011).

The Body Mass Index for age (BMI/a) was used as a criterion for assessing nutritional status. According to Figure 1, the classification of the individuals' nutritional status was based on the BMI-for-age Z-score values, using the WHO Anthro-Plus 2007 software (ONIS *et al.*, 2007).

Waist Circumference (WC) was assessed using an inelastic tape measure according to Freedman *et al.* (1999). Participants with a percentile above 90 are classified as having cardiometabolic risk and those with a percentile below 90 do not (BRAZILIAN SOCIETY OF PEDIATRY, 2021).

Figure 1. BMI-for-age cut-off points established for children and adolescents aged 5 to 19.

Critical Values	Nutritional Diagnosis
$< Z\text{-score } -3$	Marked Thinness
$\geq Z\text{-score } -3 \text{ and } < Z\text{-score } -2$	Thinness
$\geq Z\text{-score } -2 \text{ and } < Z\text{-score } +1$	Eutrophy
$\geq Z\text{-score } +1 \text{ and } < Z\text{-score } +2$	Overweight
$\geq Z\text{-score } +2 \text{ and } < Z\text{-score } +3$	Obesity
$\geq Z\text{-score } +3$	Severe Obesity

World Health Organization, 2007.

Data on food consumption was collected using a Food Frequency Questionnaire (FFQ), containing questions about food items/groups and the practice of eating breakfast (MOLINA *et al.*, 2010). A positive or negative score was given for each specific frequency, based on the guidelines for healthy eating recommended by the Ministry of Health in the first edition of the Food Guide for the Brazilian population (BRAZIL, 2006).

To assess the quality of the food, an indicator called the School Feeding Index (Ales) was used. The values of the individual absolute frequencies are added together and distributed in tertiles, forming three categories of food quality: ≤ 3 low quality, > 3 and < 6 intermediate quality and values ≥ 6 good quality (MOLINA *et al.*, 2010).

2.4 Data analysis

The data collected was stored and organized in Microsoft Excel®. The Statistical Package for the Social Sciences (SPSS), version 22, was used to analyze the data.

The Kolmogorov-Smirnov test was used to verify the normality of the sample and the Levene test to verify homogeneity. The variable Categorical data were expressed as frequencies and percentages and numerical data as means and standard deviations.

Student t-test and the Mann-Whitney test were used to compare the means of independent variables. Analysis of variance (ANOVA) was used to evaluate the difference between the tertiles of the Ales index and the numerical dependent variables. The association between the Ales index and the categorical variables was tested using Pearson's chi-squared test. All analyses were considered statistically significant if $p \leq 0.05$.

2.5 Ethical aspects

All the steps were carried out in compliance with the requirements of Resolution 466/12 of the National Health Council and its complementary provisions. This study was approved by the Research Ethics Committee of the State University of Ceara, under the protocol 3.507.172. The schoolchildren took part in the study only after their parents or guardians had signed a Free and Informed Consent Form and an Assent Form.

3. Results and Discussion

The characterization of nutritional status and diet quality are presented in Table 1. The final sample resulted in 809 students, representing a reduction of approximately 45% of the sample initially calculated, although this reduction had no impact on the representativeness of the research. The children aged 7 to 18, with a mean age of approximately 12 years ($SD = 1.94$), the majority of whom were female (55.5%). Males are significantly older ($p=0.004$) and taller (<0.001) than females.

Regarding nutritional status, the majority were found to be eutrophic (58.34%), going in accordance with the absence of cardiometabolic risk presented by 90.36% of the individuals. However, it is important to note that significant percentages for being overweight (39.06%) and poor diet quality (39.56%) were observed, although there was no significant difference between sexes.

Table 2 shows that there was no association between diet quality with BMI/age and waist circumference. Table 3 shows the association between nutritional status (BMI/a) distributed by sex and the foods investigated in the FFQ. The foods recommended for daily

consumption (Brazil, 2008) showed a significant association with nutritional status, including beans ($p = 0.027$) for males and vegetables ($p = 0.005$) and milk ($p = 0.03$) for females. There was no significant association for the legumes and fruit group.

Table 1. Characterization of the nutritional status and quality of the diet of elementary schoolchildren from municipal public schools in Fortaleza-CE according to gender.

Variables	Sex			<i>p value</i>
	Total = 809	Female = 449	Male = 360	
Age (years), mean (SD)	11.96 (1.94)	11.82 (1.85)	12.21 (2.01)	0.004^a
Weight (kg), mean (SD)	49.11(15.08)	49.15 (14.92)	49.05 (15.30)	0.921 ^a
Height (kg), mean (SD)	1.53 (11.49)	1.51 (9.42)	1.54 (13.45)	< 0.001^b
BMI/age (Z-score)				
Underweight, <i>n</i> (%)	21 (2.60)	8 (38.10)	13 (61.90)	0.177 ^c
Normal, <i>n</i> (%)	472 (58.34)	254 (53.81)	218 (46.19)	
Overweight, <i>n</i> (%)	177 (21.8)	106 (59.89)	71 (40.11)	
Obesity, <i>n</i> (%)	139 (17.18)	81 (58.27)	58 (41.73)	
Excess weight				
With excess weight, <i>n</i> (%)	316 (39.06)	187 (59.18)	129 (40.82)	0.092 ^c
Without excess weight, <i>n</i> (%)	493 (60.94)	262 (53.14)	231 (46.86)	
CC				
With cardiometabolic risk, <i>n</i> (%)	78 (9.64)	37 (47,44)	41 (52.56)	0.132 ^c
No cardiometabolic risk, <i>n</i> (%)	731 (90.36)	412 (56.36)	319 (43.64)	
Diet quality				
Low quality, <i>n</i> (%)	320 (39.56)	188 (58.75)	132 (41.25)	0.317 ^c
Medium quality, <i>n</i> (%)	161 (19.90)	85 (52.80)	76 (47.20)	
High quality, <i>n</i> (%)	328 (40.54)	176 (53.66)	152 (46.34)	

Legend: kg, kilograms; m, meters; SD, standard deviation; *n*, frequency; %, percentage; BMI, body mass index; WC, waist circumference; ^a Student's t-test; ^b Mann-Whitney test; ^c Pearson's chi-square test. $p \leq 0.05$.

Table 2. Association between the variables of nutritional status and diet quality of schoolchildren from municipal public schools in Fortaleza-CE.

Variables	Diet quality			Total	p value*
	Low	Medium	High		
BMI/age					
With excess weight, n (%)	191(38.74)	100(20.28)	202 (40.98)	493 (100.00)	0.835
Without excess weight, n (%)	129(40.82)	61(19.31)	126 (39.87)	316 (100.00)	
CC					
No cardiometabolic risk, n (%)	291(39.81)	146(19.97)	294(40.22)	731(100.00)	0.844
With cardiometabolic risk, n (%)	29(37.18)	15(19.23)	4(43.59)	78(100.00)	

Legend: n, frequency; %, percentage; BMI, body mass index; WC, waist circumference; p, p-value (p<0.05); *Pearson's chi-square test.

In other words, for males, the majority eat beans every day (68.42%) and are not overweight. For females, the majority do not eat vegetables (54.78%) nor drink milk (54.55%) every day, but most of them are not overweight.

With respect to foods whose frequent consumption is not recommended (Brazil, 2008), such as soft drinks, hamburgers, fried food, French fries, mayonnaise and instant noodles, there were some significant associations for both sexes. Most girls who were not overweight did not consume soft drinks (53.65%), hamburgers (57.41%), mayonnaise (57.11%) and instant noodles (55.27%) every day. Meanwhile, most males do not drink soft drinks (61.64%) nor eat fried food (61.68%) every day and are not overweight either.

A high prevalence of overweight (39.06%) was observed, which agrees with the results of the SISVAN annual report for 2022, which also points to a prevalence of 31.25% of overweight in children aged 5 to 10 years old and of 31.20% in adolescents.

It stands out thus that the existence of obesity among children and adolescents is associated with a greater occurrence of various health problems, such as premature death, breathing difficulties, hypertension and early markers of cardiovascular disease (WORLD HEALTH ORGANIZATION, 2021).

The data presented shows the importance of measures to prevent and control the occurrence of obesity. Dietary and physical activity interventions in the school environment have already been shown to be effective in reducing obesity rates among children (BLEICH *et al.*, 2018) and need to be included in national public policies (BRAZIL, 2022).

During school age, it is important to maintain a balanced diet with adequate consumption of all the food groups. The school therefore plays an important role in encouraging, discussing and introducing students to healthy eating (BRAZIL, 2023). The recommendation to consume these groups can be interpreted by assessing the quality of the diet, which is defined through indices and scores. These, therefore, are based on parameters for comparing diet plans, dietary patterns and dietary guidelines (HARRISON *et al.*, 2020) and can be presented in a homogeneous way as shown in this study, or with different intensities between the classifications, which will depend on the profile of eating habits of each population studied.

According to the absence of an association between diet quality and nutritional status observed in this study, we can initially highlight the possibility of underestimation or overestimation during the collection of food consumption data (RODRIGUES *et al.*, 2016).

Among the reasons for this situation is the methodological approach used to collect food consumption data, in other words, intervention studies can provide a better understanding of diet quality and its related indices (KOHL *et al.*, 2022). In addition, exposure of children and adolescents to different forms of food, stimulated by social media, can lead to distinct behaviors among schoolchildren (DUTRA; MALAGOLI, 2019).

The collection instrument to assess diet quality in this study met the need, but Rodrigues *et al.* (2016) showed that the DQI can be strongly dependent on the instrument used to obtain information on the food consumption of adolescents, emphasizing the need for different assessments to estimate this index in predicting health risk factors.

Table 3. Association between the daily consumption of foods listed in the FFQ and the nutritional status of schoolchildren according to gender.

Food item	Daily consumption	Male			<i>p value*</i>	Female			<i>p value*</i>
		Not overweight	Overweight	Total		Not overweight	Overweight	Total	
Fruits, <i>n (%)</i>	Don't eat	166 (63.85)	94 (36.15)	260 (72.22)	0.838	191 (55.85)	151 (44.15)	342 (76.17)	0.054
	Eat	65 (65.00)	35 (35.00)	100 (27.78)		71 (66.36)	36 (33.64)	107 (23.83)	
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Vegetables, <i>n (%)</i>	Don't eat	171 (62.64)	102 (37.36)	273 (75.83)	0.284	189 (54.78)	156 (45.22)	345 (76.84)	0.005
	Eat	60 (68.97)	27 (31.03)	87 (24.17)		73 (70.19)	31 (29.81)	104 (23.16)	
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Legumes, <i>n (%)</i>	Don't eat	170 (63.67)	97 (36.33)	267 (74.17)	0.739	186 (57.41)	138 (42.59)	324 (72.16)	0.513
	Eat	61 (65.59)	32 (34.41)	93 (25.83)		76 (60.80)	49 (39.20)	125 (27.84)	
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Beans, <i>n (%)</i>	Don't eat	75 (56.82)	57 (43.18)	132 (36.67)	0.027	97 (56.40)	75 (43.60)	172 (38.31)	0.508
	Eat	156 (68.42)	72 (31.58)	228 (63.33)		165 (59.57)	112 (40.43)	277 (61.69)	
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	

Milk, <i>n</i> (%)	Don't eat	130 (61.90)	80 (38.10)	210 (58.33)		156 (54.55)	130 (45.45)	286 (63.70)	
	Eat	101 (67.33)	49 (32.67)	150 (41.67)	0.290	106 (65.03)	57 (34.97)	163 (36.30)	0.030
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Soft drinks, <i>n</i> (%)	Don't eat	183 (61.41)	115 (38.59)	298 (82.78)		191 (53.65)	165 (46.35)	356 (79.29)	
	Eat	48 (77.42)	14 (22.58)	62 (17.22)	0.017	71 (76.34)	22 (23.66)	93 (20.71)	< 0.001
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Hamburger, <i>n</i> (%)	Don't eat	220 (63.58)	126 (36.42)	346 (96.11)		248 (57.41)	184 (42.59)	432 (96.21)	
	Eat	11 (78.57)	3 (21.43)	14 (3.89)	0.252	14 (82.35)	3 (17.65)	17 (3.79)	0.041
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Fried foods, <i>n</i> (%)	Don't eat	198 (61.68)	123 (38.32)	321 (89.17)		225 (57.40)	167 (42.60)	392 (87.31)	
	Eat	33 (84.62)	6 (15.38)	39 (10.83)	0.005	37 (64.91)	20 (35.09)	57 (12.69)	0.282
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
French fries, <i>n</i> (%)	Don't eat	216 (63.34)	125 (36.66)	341 (94.72)		244 (57.55)	180 (42.45)	424 (94.43)	
	Eat	15 (78.95)	4 (21.05)	19 (5.28)	0.167	18 (72.00)	7 (28.00)	25 (5.57)	0.154
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
	Don't eat	217 (64.39)	120 (35.61)	337 (93.61)	0.733	241 (57.11)	181 (42.89)	422 (93.99)	0.035

Mayonnaise, <i>n</i> (%)	Eat	14 (60.87)	9 (39.13)	23 (6.39)		21 (77.78)	6 (22.22)	27 (6.01)	
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	
Instant noodles, <i>n</i> (%)	Don't eat	206 (62.80)	122 (37.20)	328 (91.11)		215 (55.27)	174 (44.73)	389 (86.64)	
	Eat	25 (78.13)	7 (21.88)	32 (8.89)	0.085	47 (78.33)	13 (21.67)	60 (13.36)	0.001
	Total	231 (64.17)	129 (35.83)	360 (100.00)		262 (58.35)	187 (41.65)	449 (100.00)	

Legend: n, frequency; %, percentage; p value ($p \leq 0.05$); *Pearson's chi-square test

Different associations were tested between the food groups (recommended and non-recommended) with overweight and underweight schoolchildren of both sexes, highlighting vegetables, beans, soft drinks and hamburgers, among others.

According to the Food Guide for the Brazilian Population (BRAZIL, 2014), ultra-processed foods are high in fat, salt and sugar, which can lead to excessive consumption by individuals. There is a possibility that the students evaluated were not exposed to these foods, which may be the main reason why most of them have eutrophic nutritional status. According to Enes *et al.* (2019), ultra-processed foods can contribute substantially to total calories, highlighting the poor quality of young people's diets.

Several studies show that, in addition to low consumption of foods that are good for health, frequent consumption of soft drinks and ultra-processed foods is associated with a higher risk of developing the syndrome metabolic disease, type 2 diabetes and reduced intake of milk, calcium and other nutrients (ENES *et al.*, 2019; CALCATERRA *et al.*, 2023; DING *et al.*, 2024).

On the other hand, the group of schoolchildren studied was also not positively exposed to foods that act as cardiometabolic protective factors, such as fruit and vegetables. In a population study, the results of food group consumption are in line with other large national and international studies, such as ERICA (Study of Cardiovascular Risks in Adolescents) and HELENA (Healthy Lifestyle in Europe by Nutrition in Adolescence), which, when evaluating Brazilian and European adolescents, observed that the participants also did not meet the minimum consumption recommendations for fruit, vegetables and milk (RONCA *et al.*, 2019; GONZÁLEZ-GIL *et al.*, 2019). According to Gilmour *et al.* (2020), this behavior may be due to adolescents' food preferences and perception of flavors, reducing the consumption of vegetables considered unpleasant to the palate.

Alves *et al.* (2019) showed that, in general, Brazilian male adolescents have a dietary pattern with greater adherence to the consumption of rice, beans and meat. The association of bean consumption (68.42%) in males without excess weight in this study favors these individuals, since beans are a marker food for healthy eating (BRAZILIAN INSTITUTE OF GEOGRAPHY AND STATISTICS, 2022). As for milk, non-consumption of this food was associated with the absence of excess weight in females (54.55%). This may be related to the fact that adolescents have a low consumption of non-recommended foods.

In the sample of schoolchildren of both sexes who were not overweight, the majority did not consume ultra-processed foods. According to Poll *et al.* (2020), the reduction of ultra-

processed foods through nutritional intervention resulted in a decrease in BMI and waist circumference, which leads to a lower cardiometabolic risk.

As for the limitations found in this study, we can first highlight the reduction in the initial sample, which may have occurred due to the students' difficulty in answering the instrument, as well as the possibility of filling in the questionnaires incorrectly, which could hinder data analysis. Furthermore, the design of the research, since specific cuts or cross-sectional studies can limit a nutritional education intervention and subsequent change in behavior.

A third weakness of the study was the analysis of food consumption using the FFQ, since the foods were compiled and grouped together, which could underestimate the consumption of some specific foods from the food groups. Lastly, the data collection was subject to interviewee memory bias, accuracy in passing on and understanding the information requested, which was minimized by constant training and periodic evaluation of the questionnaires applied. It should also be noted that the findings of this study made it possible to characterize the nutritional status of children and adolescents with significant representation.

4. Conclusion

More than half of the schoolchildren studied were eutrophic, with a low prevalence of being overweight. As a result, most of them were not at risk of cardiometabolic diseases.

They also had high diet quality, followed by low diet quality, and there was no association between nutritional status and waist circumference and diet quality in the studied group.

Among the group of recommended foods, only beans showed a positive association between daily consumption and not being overweight. As for the group of non-recommended foods, all positive associations were between not consuming the food every day and not being overweight. Both these findings can indicate a potential protective effect against excess weight.

The results obtained from the analysis of schoolchildren's food consumption and frequency can be used to monitor and evaluate existing nutritional intervention programs for this population, as well as to design new programs.

6. Conflict of interest: We declare no conflict between the authors.

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