



NUTRITIONAL STATUS AND HABITS OF LIFE IN SCHOOL CHILDREN

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ABSTRACT

This study aimed to describe the prevalence of obesity, overweight, eating habits and the frequency of physical activity among schoolchildren from Campina Grande, Paraíba. It included 255 children from six to ten years old, whose BMI were calculated. It was considered overweight BMI e" 85 percentile <95, and obesity, BMI e" 95 percentile. Overweight and obesity was observed in 23.5% of the studied population and was higher in private school students (49.1%) than those of the public (17.1%) ($p < 0.001$), and in the boys (31,2%) than girls (16%) ($p < 0.01$). The majority of the children (66.3%) performed less than three days of physical activity per week and was observed a higher frequency of snack brought from home to school by students of private schools (83.7%), between them: biscuit (72%), soft drink (54%) and snacks (50%). The public school students had a highest intakes of biscuits (68.2%), yoghurt (61.9%) and fruit salad (55.6%). Obesity, overweight, unhealthy eating habits and sedentarism were frequent among schoolchildren. This reinforces the need to implement public policies for the prevention of obesity, as well as an intensification of nutrition education and encouraging the physical activity in schools.

Key words: obesity; overweight; child.

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INTRODUCTION

Obesity is increasing at an alarming rate and is considered a global epidemic that affects all ages, including children. It is a chronic disease defined as excess body fat¹.

In developing countries, a process of nutritional transition in recent decades has been verified, justified by the progressive increase of obesity in replacement to undernourishment². In Brazil, comparing data from the National Survey of household expenses conducted in 1974/1975, with survey data on living standards conducted in 1996/1997, only in Southeastern and Northeastern Brazil, an increase in the prevalence of obesity from 4.1% to 13.9% was observed in children and adolescents aged 6 to 18 years³.

The prevalence of obesity in children and adolescents, its biopsychosocial repercussions, the high rates of treatment failure in the treatment of obesity in adulthood and the high risk of an obese child to become an obese adult, make obesity one of the most important nutritional problems in childhood⁴.

The causes of childhood obesity are multifactorial, including biological, psychological and environmental causes⁵. The high consumption of fatty foods with high energy density and reduced practice of physical exercises are the two main factors related to the environment that contribute to excess body fat⁶. In addition, factors such as the balance between consumption and body fat accumulation, which can be genetically regulated, contribute to obesity⁷.

The increasing pattern of childhood obesity can lead to negative short and long-term consequences. In the long-term, obesity leads to an increased risk for a number of diseases, which can be divided into six groups, namely: cardiovascular diseases (hypertension, coronary artery disease and stroke), metabolic disorders (dyslipidemia and diabetes

mellitus), respiratory diseases (sleep apnea), certain cancers, gallstones, and osteoarticular diseases⁸.

In Northeastern Brazil, where child malnutrition was once quite prominent, studies on obesity and overweight are limited to specific segments and different age groups, and use different nutritional indicators, which impair a precise evaluation⁹. Therefore, investigating this condition became important, because the study could produce better knowledge on the overweight frequency schoolchildren (six years to ten years of age) in that region, which may reveal conditions similar to those found in developing countries, since this region has one of the lowest economic standard in Brazil.

Thus, the aim of this study was to describe the prevalence of obesity, overweight, eating habits and frequency of physical activity among schoolchildren from the city of Campina Grande, Paraíba.

METHODS

This was a cross-sectional and descriptive study, whose data collection occurred in four months, from March to June 2008.

The sample was composed of 285 students enrolled from the first to fifth year of elementary school, from 6 to 10 years of age. Individuals with chronic diseases that interfere directly with weight or height and those that at the assessment time showed some impediment in obtaining anthropometric measurements were excluded.

To sample calculation used the following formula: $n = (Z^2 \cdot p \cdot q \cdot n) / d^2$ ($n - 1$) + $Z^2 \cdot p \cdot q$ ¹⁰, considering a total of 24,543 students enrolled in public and private schools of the urban area¹¹ and the prevalence of overweight and obesity of 20%¹². A confidence level of 5% was adopted.

In order to respect the proportion between the number of students from

public and private schools, four public schools and two private schools were included in the study.

At first moment, the researchers made a visit to each school selected to clarify managers and teachers on the study objectives and procedures to be performed. Parents and students were informed about the research through a letter.

To obtain data, a questionnaire with information about the type of snacks and physical activities performed in school was used, as well as a protocol for recording information such as anthropometric measures, sex, age and type of school.

To obtain anthropometric measurements, each child was weighed and measured by two previously trained examiners. The simple arithmetic average of two measurements was considered as the height and weight value.

To obtain weight, a digital scale label Camry, model EF221BW with capacity of 150 kg and accuracy of 0.1 kg was used. The participants were wearing light clothing and were placed in the standing position with their feet together.

To obtain height, a stadiometer with cursor and accuracy of 0.1 cm was used. During the assessment, students were asked to remove their shoes and stay upright, with their backs on the rule, and with ankles and buttocks in contact with the stadiometer; knees straight and arms hanging loosely at their side. The head was positioned according to the Frankfurt Plan (imaginary plane that passes through the orbit and external auditory canal). The students were asked to remain in deep breath during the measurement. Thus, the cursor was placed on the students' heads, and the value immediately below the cursor was considered as the height.

From these measures, the body mass index (BMI) was calculated using the ratio body weight / (height)², body weight given in kilograms (kg) and height in meters (m)¹³.

Curves and BMI percentiles from the Centers for Disease Control and Prevention (CDC) for children and adolescents (2 to 20 years of age) were used, according to gender and age (www.cdc.org/growthcharts). Children with BMI equal to or above the 85th percentile and below the 95th percentile were considered as overweight, and those with BMI equal to or above the 95th percentile as obese.

The assessment of the prevalence of obesity and overweight took into account sex, age group (group A, 6 - 8 years of age and group B, 8 - 10 years of age) and type of school.

The survey also included the type of snack taken by students to school as well as the amount of physical activity weekly performed. To this end, a questionnaire was sent to their parents to respond.

Physical activity was measured in days per week, each day with an average of 45 to 60 minutes of activity, taken together: physical education classes in school and extracurricular sports. Physical activity was classified into four levels: 0 days / week, 1 day / week, 2 days / week, three or more days / week.

Data were entered in double entry into an electronic database. Then, they were arranged by absolute and relative frequencies. To compare the proportions between the prevalence of obesity / overweight among groups of students from public or private schools, gender and age, the chi-square test was used. Data were analyzed with the Epi Info software version 3.3.4. The statistical analysis adopted a confidence interval of 95%.

The study was approved by the Ethics and Research Committee of the "Alcides Carneiro" University Hospital (20081403-004). To obtain authorization for students to participate in this study, their parents signed the Free and Informed Consent Form, where secrecy, anonymity and privacy were respected.

RESULTS

As shown in Table 1, of the 285 children studied, 141 (49.5%) were male and 144 (50.5%) were female. With regard to age, 136 (47.7%) aged from 6 to 8 years (group A) and 149 (52.3%) aged from 8 to 10 years (group B). Regarding the school system, 57 (20%) were from private schools and 228 (80%) from public schools.

Table 2 shows that the prevalence of overweight was 14.7% and the prevalence of obesity was 8.8%, giving a prevalence of overweight / obesity equal to 23.5%. Nearly half of private school children showed overweight or obesity.

Table 3 shows that there was no significant difference in the prevalence of overweight / obesity among schoolchildren from Campina Grande when age was considered. However, when considering sex, there was a higher prevalence of boys ($p < 0.01$, odds ratio = 2.38, CI: 1.34 - 4.22) and of those from private schools ($p < 0.01$, odds ratio = 4.67, CI: 2.50 to 8.72).

Overweight was more common among private school children (49.1%) compared to public school children (17.1%), with a risk 4.67 times higher among private school children.

Table 4 shows that the frequency of schoolchildren with three or more days

Table 1: Sample distribution in relation to age group according to sex and type of school, Campina Grande, PB, 2008

Groups	Male		Female		Private		Public		Total	
	n	%	n	%	n	%	n	%	n	%
A (6 - 8)	65	46,1	71	49,3	29	50,9	107	46,9	136	47,7
B (8 - 10)	76	53,9	73	50,7	28	49,1	121	53,1	149	52,3
Total	141	100	144	100	57	100	228	100	285	100

Table 2: Nutritional status distribution according to type of school among schoolchildren, Campina Grande, PB, 2008

Nutritional Status	Private		Public		Total	
	n	%	n	%	n	%
Underweight	-	-	10	4,4	10	3,5
Normal weight	29	50,9	179	78,5	208	73,0
Overweight	19	33,3	23	10,1	42	14,7
Obesity	09	15,8	16	7,0	25	8,8
Total	57	100	228	100	285	100

Table 3: Prevalence of overweight / obesity among schoolchildren according to gender, age and type of school, Campina Grande, PB, 2008

Independent Variables	Overweight/ Obesity		Normal wight		Xi-Square p	Odds Ratio	Confidence interval
	n	%	n	%			
Sex							
Male	44	31,2	97	68,8	0,0012662546	2,3864	1,34 - 4,22
Female	23	16	121	84			
Age Group					0,2928528666		
Group A	30	22,1	106	77,9			
Group B	37	24,8	112	75,2			
Network					0,0000009086	4,6790	2,50 - 8,72
Private	28	49,1	29	50,9			
Public	39	17,1	189	82,9			

of physical activity was 33.7%. The value found in private schools was 38% and in public schools 28.9%. Therefore, most children (66.3%) had less than three days of physical activity per week.

Table 5 shows a higher frequency of snacks brought from home to school by private school children (83.7%).

When asked about the type of preferred snack consumed at school (Ta-

Table 4: Practice of physical activities among students, Campina Grande, PB, 2009

Days / week	Private Schools		Public Schools		Total	
	n	%	n	%	n	%
0	01	2	02	4,4	03	3,1
1	11	22	08	17,8	19	20,1
2	19	38	22	48,9	41	43,1
≥ 3	19	38	13	28,9	32	33,7
Total	50	100	45	100	95*	100

* Number of questionnaires returned by parents.

Table 5: Frequency of snacks brought from home to school, Campina Grande, PB, 2008

	Private Schools		Public Schools		Total	
	n	%	n	%	n	%
Yes	48	87,3	32	49,2	80	66,7
No	07	12,7	33	50,8	40	33,3
Total	55	100	65	100	120*	100

* Number of questionnaires returned by parents.

ble 6), private school children showed greater preference for the consumption of cookies, soft drinks and snacks. Dissimilarly, public school children showed hi-

gher consumption of biscuits, yoghurt and fruit salad.

Table 6: Frequency of the preference of snacks consumed at school, Campina Grande, PB, 2008

Snack	Private Schools (%)	Public Schools (%)
Finger food	50	34.9
Sandwich	42	41.2
Biscuit	72	68.2
Sweets	26	17.5
Fruits	32	52.4
Fruits salad	10	55.6
Popcorn	22	36.5
Yogurt	40	61.9
Soft drinks	54	42.8
Industrialized juice	40	15.9
Natural juice	46	42.9
Chocolate milk	22	54.0

DISCUSSION

The prevalence of overweight and obesity among schoolchildren found in this study was similar to values reported in a study conducted in Recife-PE, where the prevalence of overweight was 12.9% and obesity 8.2%, with 21.3% of excess weight¹². In the city of Natal - RN, the prevalence of overweight and obesity were 11% and 22.6%, respectively, and 33.6% of excess weight¹⁴. In Salvador, Bahia, the prevalence of obesity was 15.8%¹⁵. A previous study conducted with adolescents from Campina Grande-PB identified prevalence of obesity and overweight of 18.3% and 6.8%, respectively, with prevalence of excess

weight of 25.1%¹⁶. Comparing data from a study carried out in other region of Brazil, a study conducted in Cubatao – SP showed prevalence of excess weight of 24% among school children, 13.64% with overweight and 10.37% with obesity¹⁷.

As in this study, higher prevalence of overweight / obesity in male children was also found in a study¹⁸ carried out in Florianopolis-SC and in another study in São Paulo¹⁹. However, there is no justifiable hypothesis for such findings, which can only be attributed to isolated cases, with no epidemiological significance.

Although the socioeconomic conditions been not been evaluated, it is empirically known that, in developing countries, students from private schools belong to higher socioeconomic classes when compared to students from public schools. Therefore, the results obtained may indicate that students belonging to higher socioeconomic classes have higher prevalence of overweight when compared to those from public schools. This finding corroborates results from studies with other Northeastern cities such as Recife¹², Natal¹⁴ and Salvador¹⁵. Some authors²⁰ have reported that, in Latin America, childhood obesity is more prevalent among families with higher socioeconomic level. In another study²¹ conducted with Brazilian children under five years of age, higher prevalence of obesity in higher socioeconomic classes than in lower classes were found.

The pattern shown above is characteristic of underdeveloped countries, unlike in developed countries, where, childhood obesity is more prevalent in lower socioeconomic classes, since these families also have easy access to high caloric foods and those of higher socioeconomic classes have more information about dietary standards and physical activity²².

In Brazil, food habits provided by a higher family income with foods of high calorie content and low content of nutrients are related to a higher prevalence

of overweight / obesity at the age group studied¹⁵. In addition, computers and video games are entertainment options with little energy expenditure and more accessible to students of higher socioeconomic status²³.

The fact that most children practice less than three days per week of physical activities can be explained by the sedentary lifestyle provided by modern facilities. Although inverse relationship between the regular practice of physical activities and systematic childhood obesity has already been demonstrated, the levels of physical activity found were not lower among private school children in function of the higher prevalence of obesity found among these children. It should be surveyed whether the practice of physical exercise among obese students from private schools would not be an attempt by parents to fight the nutritional disorder of their children or the result of their higher knowledge about the benefits of physical activity.

The fact that public school students practice physical activities with lower frequency may be related to the difficulty found by those schools in relation to the availability of physical education teachers to guide students and to the lack of an adequate physical infrastructure to carry out physical activities (sports courts). Other studies, such as that carried out in Brasília²⁴ and another in Salvador¹⁵, corroborate the findings above.

On the other hand, private schools do not seem to have many difficulties regarding the availability of human or material resources for the practice of physical activities. However, this study found high overweight rates.

The fact that private school students take snacks from home to school more frequently is probably due the two situations: school lunch is offered daily in the public schools of Campina Grande, while the school lunch offered in private schools is marketed in the cafeteria, in addition, the better socioeconomic

conditions of private school children provide greater access to fast foods with high saturated fat contents²⁵.

School lunch has been the subject of great concern by parents and educators, as they often do not know what to serve to children at this time. The market provides a great availability of foods; however, they not always are most appropriate to meet the nutritional needs of schoolchildren²⁶.

Although school lunch or snacks represent only 15% of the daily intake, its composition, quality and quantity have been controversial. More than representing one of the periods for feeding, the school is responsible for a significant portion of the overall educational content, including from the nutritional point of view²⁶. Given the lack of information and ability to distinguish what is healthy from what is not, students end up by developing some unhealthy habits, which may contribute to the development of health problems, especially in relation to childhood obesity.

In recent years, the international debate on the use of school canteens as a privileged space in search for the promotion of healthy eating habits has been increasingly intense. In Brazil, Rio de Janeiro is among the cities with regulatory initiatives of this type of activity. In 2002, the ordinance No. 21217 was published, which prohibits the marketing of the following foods in public schools: sweets, candies gum base sweets, chewing gum, lollipop, powdered beverages and soft drinks. This measure was very timely for

the municipal education network since the total number of schools at the time ($n = 1033$), 63% had some form of marketing of soft drinks, cookies, candies, sweets and ice cream, and in 25 % of these schools, and printed advertising of industrialized products was found²⁷.

It is important to note that soft drinks are among the forbidden foods in schools from Rio de Janeiro in 2002, which they are one of the products most consumed by the participants of this study, both from public and in private schools, in detriment of healthy foods such as juices and fruit salad.

Therefore, given the increasing prevalence of overweight in northeastern Brazil, both public and private schools seem not to be playing their role in establishing a healthy food education for their students.

This study found a high prevalence of overweight and obesity among schoolchildren from the city of Campina Grande, especially among private schools students. This can be explained by their unhealthy eating habits, with frequent intake of foods rich in carbohydrates and fat in school lunch, as well as by the high frequency of sedentary lifestyle, less than half of them performed physical activities three times a week, the minimum frequency recommended.

These findings emphasize the need for the implementation of public policies aimed at preventing obesity, strengthening nutrition education and encouraging the regular practice of physical activities in schools.

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