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Obesity and overweight in pre-school: association with food consumption

Obesidad y exceso de peso en preescolares: asociación con el consumo de alimentos

Obesidade e excesso de peso em pré-escolares: associação com o consumo de alimentos

ABSTRACT

The research aimed to identify the prevalence of overweight and obesity and its relationship with food consumption in pre-school children from the private network. It was cross-sectional, descriptive, with a sample of 403 preschoolers. An anthropometric assessment was performed to obtain the BMI, data on the frequency of food consumption were collected. In the statistical analysis, Student's t test, the χ^2 test (Chi-square) and Kruskal-Wallis were used, with a significance level of 5%. Pearson's correlation between food consumption and BMI for age was used. The results showed that 60.1% of the children were eutrophic and 1.2% were thin. The risk of overweight, overweight and obesity was found to be 20.8%, 5.2% and 12.7%, respectively. Thus, the consumption of certain foods showed a strong correlation with BMI for age regarding the risk of overweight, overweight and obesity.

DESCRIPTORS: Preschoolers; Food consumption; Obesity.

RESUMEN

La investigación tuvo como objetivo identificar la prevalencia de sobrepeso y obesidad y su relación con el consumo de alimentos en niños en edad preescolar de escuelas privadas. Fue transversal, descriptivo, con una muestra de 403 preescolares. Se realizó una evaluación antropométrica para obtener el IMC, se recolectaron datos sobre la frecuencia de consumo de alimentos. En el análisis estadístico se utilizó la prueba t de Student, la prueba de χ^2 (Chi-cuadrado) y Kruskal-Wallis, con un nivel de significancia del 5%. Se utilizó la correlación de Pearson entre el consumo de alimentos y el IMC para la edad. Los resultados mostraron que el 60,1% de los niños eran eutróficos y el 1,2% eran delgados. Se encontró que el riesgo de sobrepeso, sobrepeso y obesidad era del 20,8%, 5,2% y 12,7%, respectivamente. Así, el consumo de determinados alimentos mostró una fuerte correlación con el IMC para la edad en cuanto al riesgo de sobrepeso, sobrepeso y obesidad.

DESCRIPTORES: Niños en edad preescolar; Consumo de comida; Obesidad.

RESUMO

A pesquisa objetivou identificar a prevalência de excesso de peso e obesidade e sua relação com o consumo de alimentos em pré-escolares da rede privada. Foi do tipo transversal, descritiva, tendo como amostra, 403 pré-escolares. Realizou-se avaliação antropométrica para obtenção do IMC, foram coletados dados da frequência do consumo de alimentos. Na análise estatística, foi utilizado o teste t de Student, o teste do χ^2 (Qui-quadrado) e Kruskal-Wallis, com nível de significância de 5%. Foi utilizada a correlação de Pearson entre o consumo de alimentos e o IMC para a idade. Os resultados demonstraram que 60,1% das crianças estavam eutróficas e 1,2% com magreza. Foi constatado risco de excesso de peso, excesso de peso e obesidade de 20,8%, 5,2% e 12,7%, respectivamente. Assim, o consumo de determinados alimentos apresentou forte correlação com o IMC para a idade referente ao risco de excesso de peso, excesso de peso e obesidade.

DESCRIPTORES: Pré-escolares; Consumo alimentar; Obesidade.

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INTRODUCTION

Childhood health is predictive of health throughout life, constituting in the early years, the foundations on which health achievement and potential are built. Adequate nutrition in the first years of life is essential for healthy development and growth.¹

In this phase, children who are obese may remain as such in adulthood, becoming potential carriers of cardiovascular disease, systemic arterial hypertension, atherogenic dyslipidemia, sleep apnea, early atherosclerosis, diabetes and non-alcoholic fatty liver disease.²

The school is a favorable space for health education and the construction of preventive actions, with a focus on quality of life, especially in vulnerable territories.³

The National Survey on Demography and Health (PNDS - Pesquisa Nacional sobre Demografia e Saúde, 2006) assessed children up to five years of age and showed a national prevalence of overweight of 6,6%, and 8,8% in the South region.⁴

The 2008-2009 HBS pointed to an increase in the prevalence of overweight in Brazil that reached 33,5% of children aged between five and nine years, ran-

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ging from 32% to 40% in the Southeast, South and Central regions. West and 25% to 30% in the North and Northeast regions.⁵

Therefore, it is of paramount importance to assess the dietary pattern and adequacy of the nutritional needs of preschool-age children, given the relevance of the composition of the child's diet for the maintenance of an adequate nutritional status. Deficiency diseases are epidemiologically related to the child's age group. On the other hand, wrong eating habits contribute to the increase of overweight and obesity.⁶

Previous studies in this region showed a statistically significant association between anemia and food consumption variables and anthropometric indicators W/A and H/A in preschoolers from Teresina-Piauí, with low intake of iron, protein, energy, calcium and vitamins, and vitamin C levels above daily recommendations.⁷

In light of the above, this research was carried out in order to know the prevalence of overweight, obesity and its correlation with the frequency of food consumption, at school and home levels, in preschoolers assisted in a private school in Teresina-Piauí.

METHODS

This is a school-based Descriptive Cross-sectional Study, which was carried out from March to June 2013 with 403 children aged from 2 to 5 years old, in private schools in the city of Teresina (PI). The research aimed to verify the prevalence of overweight, obesity and to relate it to the food consumption of preschoolers, in order to outline, in our environment, the relationship between nutritional status and food consumption.

The selected private school served children from different areas of the city. The calculation of the sample to estimate proportions considered 10% regarding overweight and obesity, in view of the literature report.⁸

Preschoolers were selected in a “probabilistic” way, and all 1.044 children enrolled in Kindergarten had the chance to participate in the research. A list of randomized numbers was used to identify each child. From each series, a sample of 110 preschoolers was drawn, resulting in 440 preschoolers. Chart 1.

Of these 440 preschoolers, at the end of the study the sample consisted of 403 children, considering that many of them missed classes on the days of the assessment, with a loss of 8,41% of the sample.

Children with any physical, motor or neurological restriction that could interfere with the collection of anthropometric data were excluded from the study. Therefore, two children were excluded from the research, whose parents authorized to participate in the research, but who fall into the exclusion group, one for

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having cerebral palsy and the other for being a dwarf, severe degree.

The research was authorized by means of an Institutional Consent Form and the study was approved by the Ethics Committee for Research with Human Beings, of the Federal University of Piauí, under CAAE 0114031200005214.

The first step was to clarify, for the direction and for the teachers, about the procedures that would be carried out and the objectives of the study. In the second stage, circulars were sent to the parents, showing the reasons for the research with the proper objectives and the Informed Consent Form (FICF) in case they accepted that their child would participate in the research. The third step was the collection of data from children whose Free and Informed Consent Form was duly signed by the students' parents.

A aferição antropométrica seguiu normas padronizadas. Foram mensuradas as variáveis: peso, utilizando uma balança tipo plataforma (até 150 quilogramas e precisão de 0,1 kg) aferida previamente; e estatura, com fita antropométrica com escala de 2 m, fixa a uma parede plana e piso sem declínio. O Índice de Massa Corporal (IMC) para criança foi determinado pelo programa Epi-Info 6.04. 9 Overweight and obesity were classified according to cutoff points, adjusted for age and gender, as per a previous study.¹⁰

Food consumption was assessed using a Food Frequency Questionnaire (FFQ), validated in a previous study.¹¹ For statistical analysis, a database was created in the Statistical Package for Social Sciences (SPSS) program, version 13.0. To verify the difference between the mean ages between the sexes, the Student's t test was used and to verify the association between nominal variables, the Chi-square test. The level of statistical significance adopted was 5% ($p < 0,05$).¹² To verify the existence of population homogeneity, the Bartlett test ($p = 0,873$) was used, which showed a normal distribution in the universe of 403 children surveyed with 95% confidence.

Chart 1 - Demonstration of the number of students who entered the draw by grade in the private school in Teresina-PI, 2014.

SÉRIE	QUANTIDADE DE ALUNOS
MATERNAL I	110 alunos
MATERNAL II	110 alunos
INFANTIL I	110 alunos
INFANTIL II	110 alunos

Fonte: Dados da Pesquisa.

Table 1- Mean and standard deviation of the variables birth weight, current weight and current height, according to the sex of the children surveyed. Teresina, Piauí, 2013.

VALUES	VARIABLES								
	BIRTH WEIGHT (KG)			CURRENT WEIGHT (KG)			CURRENT HEIGHT (CM)		
	STATISTICS: STUDENT'S T TEST = 3,296 P=0,001			STATISTICS: STUDENT'S T TEST = 2,999 P=0,003			STATISTICS: STUDENT'S T TEST = 2,423 P=0,016		
	MALE	FEMALE	GENERAL	MALE	FEMALE	GENERAL	MALE	FEMALE	GENERAL
Mean	3,294	3,113	3,202	19,102	17,782	18,427	105,0	103,0	104,0
Standard Deviation	0,8	0,7	0,5	1,7	1,9	1,5	0,1	0,1	0,1

Source: Dados da pesquisa.

RESULTS

Most children surveyed, 51,1% (206) were female, while 48,9% (197) were male. The mean and standard deviation of the variables of birth weight, current weight and current height were calculated, according to the sex of the children. Data from the study regarding birth weight, current weight and current height are shown in Table 1.

To assess the nutritional status, the following indices were used: Height to Age and BMI to Age. The height-for-age index showed that 97,8% of the studied population was within the normal range and only 2,2% of the children had short stature for their age. Table 2.

The BMI for age showed that 60,1% (242) of the 403 children surveyed were eutrophic. The data also showed that 20,8% (84) of preschool children were at risk of being overweight, while 5,2% (21)

were overweight and 12,7% (51) were obese. As in Table 3.

In the present research, the risk of overweight, overweight and obesity was found to be 20,8%, 5,2% and 12,7%, respectively (Table 3). Demonstrating a high percentage of risk of overweight and obesity in the children studied.

In the analysis between sex and nutritional status, the results showed that 13,7% of boys were obese and 23,3% were at risk of overweight. While 11,6% of girls were obese and 18,4% were at risk of being overweight. Only among eutrophics was there a significant difference ($p = 0,009$) between boys and girls. Showing that most eutrophic children were among females. Overweight children had virtually no difference, as did thinness. Figure 1.

In the population of this research, there is a prevalence of eutrophic girls, 63,7% to 56,3% of boys. For this result there was a statistically significant difference.

The frequency of food consumption showed that 100% of children consumed rice. With regard to other foods, the results showed that the most consumed daily were milk and dairy products (96,3%), beans (79,7%), fruits (76,7%), bread (62,8%), butter and margarine (54,6%) and natural juices (50,1%).

Correlation analysis was performed between food consumption and BMI for age. The consumption of foods, rice, beans, breads, pasta, milk and dairy products, snacks, flour and chocolate, showed a strong correlation

Table 2. Frequency of nutritional status according to the height-for-age index of the children surveyed. Teresina, Piauí, 2013.

CRITICAL VALUES	NUTRITIONAL DIAGNOSIS	FREQUENCY	
		N°	%
< Score-z -3	Very short stature for age	-	-
≥ Score-z -3 and < Score-z -2	Short stature for age	09	2,2
≥ Score-z -2	Age-appropriate stature	394	97,8
Total		403	100,0

Source: Research data.

Table 3. Frequency of nutritional status according to BMI for Age of the children surveyed. Teresina, Piauí, 2013.

CRITICAL VALUES	NUTRITIONAL DIAGNOSIS	FREQUENCY	
		N°	%
< Score-z -3	Accentuated thinness	-	-
≥ Score-z -3 and < Score-z -2	Thinness	05	1,2
≥ Score-z -2 and ≤ Score-z +1	Eutrophy	242	60,1
≥ Score-z +1 and Score-z +2	Risk of overweight	84	20,8
≥ Score-z +2 and ≤ Score-z +3	Overweight	21	5,2
> Score-z +3	Obesity	51	12,7
Total		403	100,0

Source: Research data.

with the risk of overweight, overweight and obesity, and for overweight, soft drinks and fried foods also showed a strong correlation.

DISCUSSION

Studies in Salvador and Maceió also found a predominance of female students over male students, with a correspondence of 54% and 56,3%, respectively, showing no statistically significant difference between genders, which is in agreement with what occurred in the present study.^{13,14} Thus, when analyzing the data from the present study with the others mentioned, the same variation was found, always close to 50% for both genders, male and female, with no variation by region of Brazil.

In Duque de Caxias, Rio de Janeiro, a survey conducted with 33 preschool children under six years of age enrolled in a day care center, the distribution, according to current weight, showed 4 children (12%) between 22 and 26,2 kg, 12 children (36%) between 17,4 to 21,4 kg, with the majority, 17 children (52%) in the weight range of 11,6 to 16,8 kg.¹⁵ When comparing the data obtained in these two surveys, it can be observed that, in relation to the current average weight, there was a considerable increase from 16.8 kg, verified in the

study by Duque de Caxias, to 18,43 kg in the present study.

In Valente's research, similar results were obtained related to the risk of overweight and obesity, 20,51% and 5,13%, respectively, being in agreement with this research. Brazil, together with Denmark, Italy and Bahvariam, is among the four countries that show a rapid increase in the prevalence of overweight and obesity in children and adolescents when assessed by BMI.¹⁶

In order to assess food consumption at school and at home, this research used a Food Frequency Questionnaire (FFQ). The FFQ is considered the most practical and informative method of assessment in studies that investigate the association between dietary intake and the occurrence of clinical outcomes, generally related to chronic non-communicable diseases.¹⁷

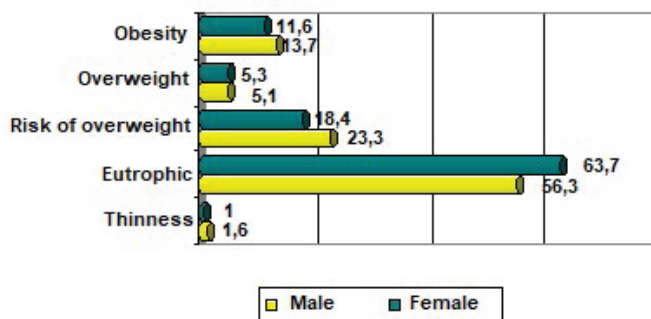
Studies carried out by Triches showed the importance of consuming fruits and vegetables for the prevention of obesity and its associated diseases, but the intake of these foods in children is well below the recommended values.^{18,19}

CONCLUSIONS

It is concluded that the prevalence of risk of overweight, overweight and obesity in preschool children was high,

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Figure 1- Percentage of children by sex in relation to BMI for Age.



Source: Survey Data.

but there was no significant difference ($p < 0,05$) related to the sex or age of the preschool children studied. With regard to BMI for age, the results showed that

60,1% of the children were eutrophic, 20,8% at risk of being overweight, 5,2% being overweight and 12,7% obese.

There was a strong relationship between

the consumption of carbohydrate and fat foods with BMI for Age, with regard to the risk of overweight, overweight and obesity. ■

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