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METABOLIC RISK FACTORS IN CHILDREN IN PRIMARY HEALTH CARE

FATORES DE RISCOS METABÓLICOS EM CRIANÇAS NA ATENÇÃO PRIMÁRIA À SAÚDE

FACTORES DE RIESGOS METABÓLICOS EN NIÑOS EN LA ATENCIÓN PRIMARIA DE SALUD

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Objective: to verify the prevalence of metabolic risk factors in the nursing consultation of children. Method: an exploratory, cross-sectional study carried out at a primary health unit in Fortaleza, Ceará, Brazil. The sample consisted of 97 children between 2 to 10 years of age during a 6-month period. Results: the most prevalent age was eight years of age, comprising N = 26 children (26.8%) and the prevalent sex in the sample was female, 62 (63.9%). It was observed that 62 children had adequate BMIs (63.9%), 23 were overweight (23.7%) and 12 (12.3%) were obese. Conclusion: the main metabolic risk factors were sedentary lifestyle, preference for fast food and low family income.

Descriptors: Pediatric obesity. Body mass index. Cardiovascular diseases. Nursing care. Metabolic syndrome.

Objetivo: verificar a prevalência de fatores de riscos metabólicos na consulta de enfermagem de crianças. Método: estudo exploratório, transversal, realizado em uma unidade básica de saúde em Fortaleza, Ceará, Brasil. A amostra foi composta por 97 crianças de 2 a 10 anos de idade no período de 6 meses. Resultados: a idade que mais prevaleceu foi a de oito anos, abrangendo N=26 crianças (26,8%) e o sexo prevalente na amostra foi o feminino, 62 (63,9%). Notou-se que 62 crianças estão com o IMC adequado (63,9%), 23 estão com sobrepeso (23,7%) e 12 (12,3%) estão obesas. Conclusão: os principais fatores de riscos metabólicos encontrados foram sedentarismo, preferência por alimentos do tipo fast-food *e baixa renda familiar.*

Descritores: Obesidade pediátrica. Índice de massa corporal. Doenças cardiovasculares. Cuidados de enfermagem. Síndrome metabólica.

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Objetivo: verificar la prevalencia de factores de riesgo metabólicos en la consulta de enfermería de niños. Método: estudio exploratorio, transversal, en unidad básica de salud, en Fortaleza, Ceará, Brasil. Muestra compuesta por 97 niños de 2 a 10 años de edad, en el período de 6 meses. Resultados: edad más prevalente fue la de ocho años, abarcando N=26 niños (26,8%) y el sexo prevalente en la muestra fue el femenino, 62 (63,9%). Se observó que 62 niños están con IMC adecuado (63,9%), 23 con sobrepeso (23,7%) y 12 (12,3%) obesos. Conclusión: los principales factores de riesgos metabólicos encontrados fueron sedentarismo, preferencia por alimentos del tipo fast-food *y baja renta familiar.*

Descriptores: Obesidad pediátrica. Índice de Masa Corporal. Enfermedades cardiovasculares. Atención de enfermería. Síndrome metabólico.

Introduction

Obesity is a serious threat to public health. This is due to the worldwide increase in its prevalence in the population its impact on society. Data from the year 2009 from the Brazilian Institute of Geography and Statistics, in research involving ninth grade students, in all Brazilian capitals, showed obese and overweight children were the principal nutritional problems identified[1].

By the year 2025, it is possible that the number of obese and overweight children in the world can reach 75 million, making childhood obesity one of the biggest health problems today and for the future, according to a report by the World Health Organization[2].

Children with increased blood pressure are more likely to become hypertensive in later life. In addition, the early presence of increased blood pressure levels is one of the risk factors associated with the development of atherosclerotic abnormalities in young adults[3].

Studies on obesity in society have increased in recent years. Given the importance of physical performance levels for good health, especially during the school stage, where motor development occurs, as well as the worldwide increase in childhood obesity, it is important to know the prevalence of obese and overweight children and whether physical performance is affected by body composition[4].

The state of Ceará is currently the Brazilian state with the highest percentage of obese children, with 12.0% recorded in 2015. Children from zero to five years of age, of both sexes from the Brazilian population, need to receive more education and attention regarding changing their eating habits in order to avoid future diseases[5-6]. Parents, family, health professionals and society play key roles in the overall development of the human being, both in acquiring a healthy lifestyle and for healthy eating behaviors[7-8].

The metabolic syndrome is a group of disorders that includes obesity, insulin resistance, high triglyceride levels, low HDL levels (High Density Lipoproteins) and hypertension. Although the prevalence of cardiovascular diseases and metabolic syndrome are lower in children, excess body fat is the most important risk factor [8]. In children, obesity is associated, in most cases, with elevated triglyceride levels[9] and low HDL, which is a strong and independent predictor of increased cardiovascular risk.

Despite the high correlation with body mass index (BMI), hypertension is infrequent and fasting hyperglycemia is lower, which is common in adult obesity. The emphasis on high cardiovascular (CV) risk factors in children is logical for pediatricians who have always been at the forefront of preventive medicine. However, it is important to recognize that a focus on metabolic syndrome, rather than on individual risk factors, may not be the most effective approach for preventive care or treatment[7].

Insulin resistance (IR) has emerged as an significant disorder among young populations. Studies have highlighted that patients with IR are more predisposed to the future development of MS, DM2 and cardiovascular disease. Among

the different methods used to estimate IR are the direct methods, which aim to analyze the effects of a predetermined amount of administered insulin (insulin tolerance test, insulin suppression test and clamping), and the indirect ones that evaluate the effect of endogenous insulin – fasting insulinemia, HOMA (homeostasis model assessment) and the oral glucose tolerance test (OGTT)[3].

Realizing that the child is overweight is essential for the parents to seek help from a professional, seeking improvement and treatment. However, parents do not often realize their child's weight gain, and consider their weight normal, making it difficult for them to realize the need to seek professional help[10].

It is considered that undetected metabolic changes in obese children tend to manifest themselves with age. Therefore, it is recommended that nurses intensify their strategies, applying their actions and orientations in nursing consultations as early as possible, for the prevention and/or treatment of obesity and its comorbidities[11-12].

Thus, bad diets and lack of physical activity, considered factors that influence body weight, may lead to the development of obesity and, consequently, each of the components of the syndrome[7].

Primary health care is the reference point for identifying children at risk of developing obesity and the metabolic syndrome. Therefore, it is the nursing team and the nursing professional´s responsibility to work towards preventing the development of pathologies, and to work towards health education and the active treatment of the morbidities and comorbidities caused by the clinical condition.

This study aimed to verify the prevalence of metabolic risk factors in children during the nursing consultation.

Method

A cross-sectional, exploratory study carried out in a Primary Health Care Unit located in the city of Fortaleza (CE), in the Northeast region of Brazil. The sample consisted of 97 children between 2 and 10 years of age who were consulted by a nurse within a 6 month period and presented at least one metabolic syndrome risk factor. Children who were not accompanied by their legal guardian at the time of the consultation were excluded from the sample. The calculation for finite populations was used for the sample selection, considering a confidence level of 95.0%, expected frequency of 42.0%, sampling error of 10.0% and variance of 1.0, obtaining a sample of 97 patients.

Data was collected from forms that the parents or guardians of the children filled out which contained sociodemographic questions and clinical history. A physical examination was alsoperformed to obtain anthropometric data and individual components related to the metabolic syndrome.

Participants were submitted to a nursing consultation, anamnesis and physical examination, which lasted approximately 50 minutes, during which anthropometric measurements, blood pressure measurements, information on food consumption, adherence and time spent on activities were obtained. The form was completed by the researcher in an interview with the parents and / or guardian.

Body mass index (BMI)[13] was calculated using weight and height measurements. The Z score was also used. To measure abdominal circumference, the reference point used was from the lower edge of the last rib to the upper edge of the iliac crest, passing the tape around the waist between both points[14].

Blood pressure was measured according to the *National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents* and classified according to gender, age and height, the cutoff point was systolic or diastolic blood pressure equal to or greater than 90 percentile[15].

The data were processed in the Statistical Package for the Social Sciences (SPSS) and analyzed by descriptive statistics.

The study complied with the formal requirements contained in national and

international standards regulating research involving human beings. The research was submitted to the Ethics Committee for Research Involving Human Beings and approved by Opinion 1.068.269, in accordance with National Health Council Resolution 466/12[16].

Results

The sample consisted of 97 children, among which 62 were female (63.9%). The age group that prevailed the most was the group of children aged between 8 and 10 years of age which was comprised of 49 children (50.5%).

For the classification of the body mass index (BMI), the weight and height of children were classified in percentiles: Low BMI for age (< 3rd percentile) Adequate or eutrophic BMI (≥ 3rd Percentile and < 85th Percentile 85), overweight (≥ 85th Percentile and < 95th Percentile) and obesity (≥ 95th Percentile 95).

Table 1 shows that 62 children had adequate BMIs (63.9%) and 23 were overweight (23.7%). Among the 23 overweight children, 17 were female. The prevalence of "Low BMI for age" did not have any results. Obesity was also present in the results in 12 children (12.4%), with of these 8 being females.

Table 1 – Distribution of BMI variables and abdominal circumference in the sample. Fortaleza, Ceará, Brazil – 2018 (N = 97)

Clinical variables	n	%
BMI		
Low BMI for age e	-	-
Adequate BMI	62	63,9
Overweight	23	23,7
Obese	12	12,4
Abdominal Circumference		
P 10	9	9,2
P 25	33	34,0
P 50	37	38,1
P 75	16	16,4
P 90	2	2,3

Source: Created by the authors.

Note: Conventional sign used:
- Numerical data equal to zero not resulting from rounding up.

In the present study, only 2 (2.3%) children, 1 male and 1 female, were classified in the 90th percentile. There were 37 (38.1%) children in the 50th percentile, 23 being girls, who were in the adequate percentile.

Among the 97 children studied, 93 (95.8%) said they spent most of their time watching television, shown in Table 2. According to the children´s parents/guardians, the only time the children did not watch television was when they were in school. Regarding the physical education classes, the parents/guardians of 87 children (89.6%) reported that the school offered physical education classes and that 50 of the children (51.5%) participated in such classes.

Table 2 – Distribution of the socioeconomic variables of the children in the sample. Fortaleza, Ceará, Brazil – 2018 (N = 97) (continued)

Socioeconomic variables	n	%
Watches television		
Yes	93	95.8
No	4	4.2

Table 2 – Distribution of the socioeconomic variables of the children in the sample. Fortaleza, Ceará, Brazil – 2018 (N = 97) (conclusion)

Socioeconomic variables	n	%
Does the school offer Physical Education classes		
Yes	87	89.6
Noo	-	-
Sometimes	-	-
Not applicable	10	10.4
Do you bring your own snacks to school		
Yes	7	7.2
No	82	84.5
Sometimes	8	8.3
Do you buy snacks at school		
Yes	10	10.3
No	82	84.5
Sometimes	5	5.2

Source: Created by the authors.

Note: Conventional sign used:
- Numerical data equal to zero not resulting from rounding up.

The majority of the children, 82 (84.5%), reported not taking snacks to school. Among these, 79 (81.4%) ate the snack that the school offered and 18 children (18.5%) did not accept the meal offered by the school. 82 children (84.5%) reported that they did not purchase any snacks at school.

When asked if they did any kind of activity outside the school environment, 78 (80.4%) reported not doing so. Among those who said that they did, 19 (19.5%) practised swimming, capoeira, martial arts or recreational activities.

Regarding the children´s favourite type of food, (41.9%) reported processed foods and fast food, but the option for fruits (22.2%) was not ruled out.

In the interviews with the parents/guardians, the most common level of completed education among all participants was at high school level, with 67 (69%) reported completing, 2 (2,0%) reported never having studied and 5 (5.1%) had third level education. When reporting the number of people living in the same household, 35 (36.0%) said they lived with 4 people and 35 (36.0%) responded with living with 5 or more people in the same house, followed by 27 (27, 0%) who lived with 3 people.

Regarding family income, 54 (55.0%) reported receiving 2 minimum salaries, 3 (3.0%) did not respond or had no income. The majority of the interviewees, 80 (82.4%), were married, 56 (57.7%) worked and 41 (42.2%) did not work.

Blood pressure values were measured in boys and girls, according to age and height percentile. Blood pressure was measured using the auscultatory method twice, following established international parameters[14]. The procedure was performed in a controlled environment. The children remained seated during the procedure and there was a five-minute interval between the first and second measurements.

Regarding the blood pressure percentile in the group of boys, 31 (91.8%) were in the 50th percentile, and only 3 children (8.8%), a 5-year and 2 10-year-olds were in the 90th percentile. In the group of girls, (85.4%) were in the 50th percentile and 9 (14.5%) were classified in the 90th percentile. Among the 62 (63.9%) female children, only 1 did not allow her blood pressure to be measured.

Discussion

By assessing the children's nutritional status it was possible to observe that the overweight factor

was present among children and adolescents. This fact was identified in a previous study, which showed a change in the nutritional characteristics in the infant and juvenile population, particularly in the 8 to 12 age range[17].

Faced with this information, the development of actions and policies for re-education and changes in eating behavior within this public is an urgent matter, with the school environment being one of the most important environments capable of supporting this new behavior. However, rates of obese and overweight children persist in schoolchildren, despite most of the children receiving their food from the school itself. This fact is proven in another study that investigated overweight and obese children, which found 68.0% of school children with adequate BMIs and 16.0% being overweight according to the BMI assessment[18].

Although this study demonstrated that most of the studied children were eutrophic and the family income was reasonable, it became clear that poor nutrition was a factor present in these children and therefore a variable that influences health.

One study found no differences in the BMIs between the sexes (27.3% for male students and 29.8% for female), with the average for boys being 16.2 kg/m^2 for adequate BMI, an average of 20.5 kg/m^2 for overweight; for obesity, the mean was 24.8 kg/m^2 and for the girls the averages were 16 kg/m^2, 20.4 kg/m^2 and 24 kg/m^2 respectively ; the prevalence of the entire sample was 26.4%[19].

In another study done with children and adolescents aged between 2 and 18 years of age, it was observed that, from the age of 8, the male gender appeared to be more prevalent compared to the female for the 50th percentile regarding abdominal circumference[20].

Eating behavior is strongly associated with the child's nutritional status. A survey carried out with 4th and 9th grade students from public and private schools shows that the accumulation of fat in the abdominal region was more evident in the students in the stage of initial sexual maturation, with 79 students (28.2%) with BMIs <85, followed by children under 12 years of age (29.7%), in the age group of 8-12 years old with 151 students (74.8%)[21].

A study conducted in 2015 identified that children spent more than 5 hours a day doing sedentary activities (television, computers, video games), compared to moderate to vigorous physical activities, which shows the strong tendency for sedentarism and consequent tendency for weight gain[18].

In this study, income can influence the child's food source, in the variable that has the most affinity, the children stated that they eat high-calorie foods, such as salty foods, soft drinks and French fries. Evidence from a study carried out with schoolchildren between 5 and 7 years of age also indicates that they consume more processed foods, as they are more practical due to the parents busy working schedules and subsequent lack of time to prepare homemade meals. Such a finding incentivises schools to change this eating behavior by offering healthy foods and adding dynamic subjects about nutrition within the classroom environment[19]. These findings are consistent with the findings of the present study.

Adolescents whose families earn less than the minimum wage are more likely to suffer from food and nutritional deficiencies compared to those whose families who have an income equal to or greater than the minimum wage, this highlights that earning a lower income is a factor risk for food insecurity[20].

Family income influences children's nutrition, indicating that having a higher income allows families to buy healthier food[22-23]. As a health educator, the nurse can carry out interventions and develop plans according to the family's income in order to include healthy food for the family and the child, which can help the child's development and show the family that it is possible to obtain healthier and more affordable food with a lower income.

The limitation of the present study was the fact that the investigation of the sample was in only one primary health care unit and which could be extended to other units in order to obtain broader results.

Conclusion

The study showed that most of the children present in the sample do not have adequate eating behaviors for their growth and development. The adequate intake of vitamins, proteins and carbohydrates is being substituted for fast food consumption and, with this, the increase of overweight and obese children can be easily found in an evaluation, with emphasis on weight, height, abdominal circumference and blood pressure check, demonstrating the importance of performing anamnesis and careful physical exams in children at risk of developing metabolic syndrome.

Even with the low intake of healthy food, most children were classified as having an adequate BMI.

It was concluded that the main metabolic risk factors found in nursing consultations were sedentarism, preference for fast-food and low family income. Therefore, it is important that nurses contribute to health education by promoting healthy environments by investigating the health of the child and the parents/guardians during consultations.

Further investigations are required in order to improve the understanding on the dynamics of metabolic disease risk factors in children. As this study highlighted reference values compared to other studies, focusing on blood pressure and waist circumference, further research on this subject is welcomed.

Collaborations:

1. conception, design, analysis and interpretation of data: Thayana Alcântara Martins and Carla Monique Lopes Mourão;

2. writing of the article and relevant critical review of the intellectual content: Thayana Alcântara Martins, Alisson Salatiek Ferreira de Freitas, Rubens Nunes Veras Filho and Deborah Pedrosa Moreira;

3. final approval of the version to be published: Maria Iara de Sousa Rodrigues and Carla Monique Lopes Mourão.

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