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LITERATURE SYSTEMATIC REVIEW ARTICLE

PREVALENCE OF OBESITY IN CHILDREN INTRODUCED IN THE ELEMENTARY SCHOOL: SYSTEMATIC REVIEW

PREVALÊNCIA DE OBESIDADE EM CRIANÇAS INGRESSAS NO ENSINO FUNDAMENTAL: REVISÃO SISTEMÁTICA

LA PREVALENCIA DE LA OBESIDAD EN LOS NIÑOS INGRESSAS EN LA ESCUELA PRIMARIA: REVISIÓN DE LA LITERATURA

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ABSTRACT

Objective: to know, in the literature, childhood obesity rates in the school environment. ***Method:*** descriptive and exploratory study, conducted in the Virtual Health Library (VHL), in the following databases: Scientific Electronic Library Online (SciELO), Latin American and Caribbean Health Sciences (LILACS) and Nursing Database (BDENF). ***Results:*** it was evidenced a significant proportion of overweight and obese children in the kindergarten and in the elementary school, as the prevalence of this pandemic in several Brazilian regions, arising from factors associated with socioeconomic, demographic and bad eating habits. ***Conclusion:*** it should be confirmed that the obesity is a public health problem, because it is affecting young people, adults, and also children, which could lead to the early onset of diseases, before seen only in people with older ages, furthermore, it should be of utmost importance that healthcare professionals and nursing students are aware of this issue, aiming at its wider dissemination and understanding. ***Descriptors:*** Child Health; Obesity; School health; Feeding Behavior; Public Health.

RESUMO

Objetivo*:** conhecer, na literatura, os índices de obesidade infantil no âmbito escolar. ***Método: estudo descritivo-exploratório, realizado na Biblioteca Virtual em Saúde (BVS), nas bases: Scientific Electronic Library Online (Scielo), Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs) e Base de Dados de Enfermagem (BDENF). ***Resultados*:** evidenciou-se parcela significativa de crianças com sobrepeso e obesidade no ensino infantil e fundamental, bem como a prevalência dessa pandemia em várias regiões do Brasil, decorrentes de fatores associados a condições socioeconômicas, demográficas e de maus hábitos alimentares. ***Conclusão*:** pode-se ratificar que a obesidade é um problema de saúde pública, visto que está afetando aos jovens e adultos, e também as crianças, podendo levar ao aparecimento precoce de doenças, antes vistas em idades mais avançadas, além do mais, considera-se de suma importância que os profissionais da saúde tenham conhecimento desta temática, visando sua maior divulgação e compreensão. ***Descritores*:** Saúde da Criança, Obesidade; Saúde Escolar; Comportamento Alimentar; Saúde Pública.

RESUMEN

Objetivo: conocer las tasas de obesidad infantil en las escuelas. ***Método:*** estudio descriptivo mediante revisión en la Biblioteca Virtual en Salud (BVS), en los sistemas virtuales Scientific Electronic Library Online (SciELO), América Latina y el Caribe en Ciencias de la Salud (LILACS) y la Base Enfermería (BDENF). ***Resultados:*** se encontró la existencia de un número significativo de niños con sobrepeso y obesos, así como la prevalencia de la pandemia en diversas regiones de Brasil, debido a factores relacionados con los hábitos socioeconómicos, demográficos y malos. ***Conclusiones***: se puede ratificar que la obesidad es un problema de salud pública, ya que está afectando a los jóvenes, adultos y también niños, y puede conducir a la aparición temprana de la enfermedad antes visto en las edades más avanzadas, por otra parte, considera fundamental que los profesionales de la salud son conscientes de esta cuestión con el objetivo de su difusión y comprensión. ***Descriptores:*** Salud del Niño; Obesidad; Salud Escolar; Conducta Alimentaria; Salud Publica.

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INTRODUCTION

Obesity is a pandemic, constituting itself in an important health problem, both in first-world nations, as in developing countries.[1] According to reports from the World Health Organization (WHO), the prevalence of the childhood obesity has grown at around 10 to 40% in most European countries in the last ten years.[1,2]

In childhood, an adequate food intake is associated with healthy growth and development. On the other hand, the nutritional disorders are the consequences of misuse or imbalance in the nutrient intake with regard to the nutritional needs.[3]

Excess weight in childhood predisposes to several complications, encompassing psychological and social spheres, as there is an isolation and withdrawal from social activities due to discrimination and decreased acceptance on the part of society, and organic, as it can cause respiratory problems, diabetes mellitus , arterial hypertension, dyslipidemias, among other disorders.[4,5] Due to its consequences, obesity has become a worldwide concern, not only because the incidence is increasing, but also its magnitude, since obese children have twice the risk of becoming obese adults, compared to the non-obese.[6]

Studies in other Brazilian states, with kindergarten and elementary children, showed the prevalence of overweight and obesity. The obesity rate in the city of Rio Branco[3], Acre state, was 4.9%. In the city of Belém, in Pará state, the prevalence of overweight and obesity, taken together, showed a rate of around 7.4%. [7] Moreover, the factor concerning the family income may be associated with overweight. Scholars[8] have demonstrated that there is a prevalence of obesity in children less than five years, ranging from 2.5%, among the poorest people, to 10.6%, in the economically favored group.

Based on the above mentioned, we made evident the following research question: what are the childhood obesity rates in the school environment? By having like objective: to know the childhood obesity rates in the school environment, identifying in the literature the causes and consequences for this specific group.

The consensus is that childhood obesity has significantly been increased and that determines several complications both in childhood and adulthood. Furthermore, it is a common and complex clinical problem, which is major source of frustration for healthcare professionals and patients; and, mainly, is a great therapeutic challenge.[9]

It is intended to contribute to discussion of the issue regarding the degrees of obesity in children introduced in the kindergarten and in the elementary school, reflecting on the intervention of health professionals in improving the life quality of this group present in school institutions.

METHODOLOGY

This is a descriptive and exploratory study, which exposes characteristics of a given population or a given phenomenon and aims at identifying factors that determine or contribute to the occurrence of phenomena.[10,11]

The work was operationalized through systematic literature review, based on secondary surveys that address the issue in question. The data collection for the research was conducted from April to November 2011.

We have analyzed publications in the libraries of the SciELO and VHL systems, in the LILACS and BDENF sources, published from 2003 to 2009. The search for papers was performed with the descriptors: “obesity”, “childhood obesity”, “overweight child”, “school obesity” and “factors for obesity”.

Descriptors	Database		
	LILACS	SciELO	BDENF
Obesity	5404	1529	121
Childhood obesity	343	73	14
Overweight child	33	03	00
School obesity	413	45	07
Factors for obesity	1262	429	10
Total	7455	2079	152

Figure 1. Quantitative distribution of bibliographies found in the LILACS, SciELO and BDENF databases - 2003/2009.

Due to the found quantitative, we held the first refining of the research, with the combination of descriptors, in search for papers that met the purpose of the study. So, the words "obese" and "obesity" to "school" were specifically associated. For the second refining, we have selected only full papers

and written in Portuguese, resulting in a total of 239 papers.

For selecting potential surveys, a detailed pre-reading of summaries was performed, assimilating the main ideas for the conduction of the selective reading. This second reading has covered all content, selecting the most appropriate according to the purpose of the study, resulting in a total of 10 papers that met our proposal:

Descriptors	Database		
	LILACS	SciELO	BDENF
Obesity and students	01	02	00
Childhood obesity	01	02	00
Overweight child	00	01	00
Factors for obesity	00	01	00
Childhood obesity and students	02	00	00
Total	04	06	00

Figure 2. Distribution of surveys published in the period from 2003 to 2009, according to virtual sources in 2011.

After selecting the potential literature, an interpretative reading was performed, aiming at understanding and interpreting, besides expanding the view on the issue. Then, there was a textual analysis to capture and seize the central message without intervening in the content built by the author. Practically, it was a question of targeting to the text, questions whose answers provided material for analysis. Thus, we have considered three categories: causes / factors, consequences and childhood obesity prevention.

DISCUSSION

The discussion was organized in order to describe the collected information in accordance with the organization of thematic categories for textual analysis. It should be highlighted that all selected publications belong to the SciELO database, see in figure three (3) potential literature surveys, according to author, year, title, journal and thematic categories.

Author(s)	Year	Title	Journal	Category
Silva *etal.* [18]	2003	Prevalence of overweight and obesity in pre-school children enrolled in two private schools in Recife, Pernambuco.	*Revista Brasileira de Saúde Materno Infantil*	Childhood obesity prevention.
Oliveira *etal.*[12]	2003	Overweight and Childhood Obesity: Influence of Environmental and Biological Factors in Feira de Santana, Bahia.	*Arquivos Brasileiros de Endocrinologia e Metabologia*	Causes / factors of the Childhood obesity.
Souza £ Cruz. [3]	2005	Nutritional condition of kindergarten school children in Rio Branco / AC.	*Revista Brasileira Cineantropometria e Desempenho Humano*	Childhood obesity prevention.
Neves *et al.* [6]	2006	Anthropometry of students when entering in the elementary school in the city of Belém, Pará.	*Revista Brasileira de Saúde Materno Infantil*	Childhood obesity prevention.
Fernandes, Gallo £ Advíncula. [19]	2006	Anthropometric assessment of pre-school children in the city of Mogi-Guaçú, São Paulo: subsidy for public health policies.	*Revista Brasileira de Saúde Materno Infantil*	Childhood obesity prevention.
Mondini *etal.*[13]	2007	Prevalence of overweight and associated factors in children introduced in the elementary school in a municipality at the metropolitan region of São Paulo, Brazil.	*Caderno de Saúde Pública*	Causes / factors of the Childhood obesity.
Vieira *et al.* [14]	2008	Nutritional conditions of students from 1st to 4th grades of the Elementary School from urban schools at the city of Pelotas, Rio Grande do Sul, Brazil.	*Caderno de Saúde Pública*	Causes / factors of the Childhood obesity.
Farias *et al.* [15]	2008	Nutritional status of students in Porto Velho, Rondônia.	*Revista de Nutrição* Brazilian Journal of Nutrition	Causes / factors of the Childhood obesity.
Pereira *etal.* [17]	2008	Obesity and its Association with Other Cardiovascular Risk Factors in Students of Itapetininga, Brazil.	*Arquivos Brasileiros de Cardiologia*	Causes / factors of the Childhood obesity.
Nogueira £ Sichieri. [16]	2009	Association between consumption of soft drinks (sodas), juices and milk, with body mass index in public school students in Niterói, Rio de Janeiro, Brazil.	*Caderno de Saúde Pública*	Causes / factors of the Childhood obesity.

Figure 3. Distribution of the selected potential literature survey.

● Causes / factors of the Childhood obesity

This category involves the causes and factors that can lead a child to develop obesity. Five publications were selected, listed above.

In a cross-sectional cohort study[12], in 28 schools from public and private teaching networks in the urban area of the city of Feira de Santana, Bahia state, with 699 children aged from five to nine years, socioeconomic factors, such as high family education, high family income and presence of TV, computer, phone and video game were positively associated with childhood obesity. The study concluded that the fact that children study in a private school and being only-begotten son are the main predictive factors in determining weight gain, data that confirm the influence of the family microenvironment and the macroenvironment in the genesis of the overweight / obesity.

The second study[13] was conducted with 1.014 children from the city of Cajamar, São Paulo state. It was found that the proportion of children introduced in the elementary school who were overweight was 10.8%, whereas obesity reached a rate of 6.2%. This study has pointed out as risk factors: obese mothers, high frequency of "unhealthy" food consumption, daily watching TV for four hours or over and household per capita availability of soybean oil exceeding 23.65 ml (about three tablespoons soup/day).

In the third study[14], 20.084 students from 1st to 4th grades from public and private schools at the city of Pelotas, Rio Grande do Sul, were assessed. The prevalence of overweight was 29.8%, being that girls under seven years old reached the rate of 41.1% for the same prevalence. In the item obesity, 1825 students are fitted, i.e., 9.1% of the wholeness. The prevalence was greater among boys less than seven years old, whose value reached 14.1%. Overweight and obesity were more prevalent among students from private schools in comparison with those originating from state and municipal schools. In both sexes, age was negatively associated with overweight and obesity. The authors concluded that the nutritional condition of students depends, besides demographic and socioeconomic factors, on the school type.

The fourth study[15], conducted with the participation of 1.057 students aged from seven to ten years old in the municipal school network from the city of Porto Velho, Rondônia state, found 71 students with overweight and 34 obese. There was also a predominance of overweight and obese students in households with 3 or 4 people. It was concluded that the elementary school students, from the municipal school network at the Rondônia capital of, have low malnutrition or overweight / obesity rates.

As for the fifth study[16], it was conducted in 22 public schools in the city of Niterói, Rio de Janeiro state. It was a cross-sectional study with 1.423 students, whose age group ranged from nine to 16 years old, which aimed at evaluating the association between the sugary drinks and milk consumption with body mass index (BMI) in students. The prevalence of overweight and obesity in the surveyed population were 14.8% and 4.4%, respectively. There was a positive association between frequency of soda consumption and age, and a negative correlation between milk consumption and age.

Only for girls, BMI was positively associated with the juices consumption. Regarding other beverages, associations between BMI and habitual frequency of consumption were not found. The soft drinks and juices consumption accounted for approximately 20.0% of the wholeness of daily consumed average energy. The results indicated that efforts to reduce energy intake through beverages should also emphasize the juices.

● Analytical synthesis of the category

It was noticed that the causes and factors that trigger the childhood obesity are diverse, which are related to child's nutrition, heredity, family and school environments, since they were treated as potential circumstances involved in the childhood obesity. The authors have cited the high family income as a risk factor, since there is easier access to fatty and sugary foods by families with higher incomes. The habit of watching TV, associated with a sedentary lifestyle, also contributes to the obesity, because the child spends little required energy to maintain the nutritional balance. The students from private schools are also more vulnerable to the obesity. This might be due to the lack of options for healthy foods and varied options for beverages, like sodas, high-calorie foods, fatty and sugary foods in canteens of the establishments in question.

● Consequences of the childhood obesity

This category involves the consequences that the obesity can cause on children. One publication was selected, which is also described in Figure 3.

Aiming to determine the prevalence of hypertension, dyslipidemia, obesity and its correlations in a sample of students from the city of Itapetininga, São Paulo state, given the

scarcity of data about childhood obesity and cardiovascular risk in Brazil, a cross-sectional cohort study with 494 children and adolescents of both sexes aged between two and 19 years was made. [17]

Of the participants, 11.7% had systemic arterial hypertension (SAH), 51% showed increased total cholesterol, 40.5% showed increased LDL, 8.5% showed increased triglycerides rate and 6.1% had low HDL values. Obesity and overweight were detected in 12.8% and 9.7% of the sample, respectively, being that the obesity pointed out a greater chance of detecting dyslipidemia and hypertension when compared to other groups.

● Analytical synthesis of the category

It should be realized that obesity is one of the predisposition factors to physiological changes, mainly in the cardiovascular system. Therefore, it is necessary to be aware of the predisposing factors discussed in the previous category regarding the youth period, since obese children and adolescents are likely to suffer from non-communicable degenerative chronic diseases, namely: SAH, dyslipidemias, high total cholesterol and more severe cases, such as: acute myocardial infarction and arteriosclerosis. These disorders are more common in adults and elderly people.

● Childhood obesity prevention

This category involves the guidelines concerning the prevention of the childhood obesity. Six publications were selected, described in Figure 3.

In the first survey[18], the authors conducted a cross-sectional cohort study with 230 children enrolled in two private schools from the city of Recife, Pernambuco state, in 2000. The authors found the prevalence of overweight in 22.6%, whereas the obesity rate was of 11.3%. Among girls, the prevalence of overweight has reached 27.0%. Boys showed higher obesity rates, whose prevalence reached 13.0%. The middle or high socioeconomic status of these children was pointed out as a predisposing factor for the high overweight and obesity rates. As a preventive measure to be adopted, it should be pointed up the role of pediatricians in the detection and treatment of this condition, still during the childhood, being that the nutritional assessment must be a priority in the pediatric consultation.

The second study[3] was conducted in the capital of the Acre state, Rio Branco. 292 children from the kindergarten in five schools were selected. Regarding the obesity, it was found that the weight-for-age and weight-for-height rates showed similar percentages between both genders. Nonetheless, as for the height-for-age rate, females showed a higher percentage (10.2%) in comparison with males (3.4%). Hence, it is suggested that the public policy planning and political-educational project planning of schools also consider the obesity cases among students as a control measure. Thus, it is clear that intersectoral political measures, and wide-ranging, to meet the public at stake.

The third study[7] was conducted in Belém, Pará state. Among the 637 students, whose ages ranged from six to nine years old, 3.6% of them were overweight and the obesity percentage was of 4.4%. In the ratio between nutritional condition of students and maternal education, it was found a statistical significance only in the association between child obesity and maternal education less than four years. This study pointed out that the accomplishment of national censuses as a tool for nutritional surveillance would be important in identifying nutritional risks, and as an indicator of health policies in Brazil, similar to what is done in other countries. Sum up to that the encouragement for performing periodic studies, by using the height-for-age and weight-for-height indicators as resources for assessing the children overweight.

In the fourth study[19], it drew the participation of 347 children aged from three to seven years old in nine public schools from the city of Mogi-Guaçú, São Paulo state. This study showed that, of the wholeness of the surveyed children, a little more than 26.0% were above the appropriate weight for age, when the BMI is taken into consideration. Regarding the individual biological susceptibility, among the predisposing factors to overweight and obesity, it should be cited: positive energetic balance (when the amount of consumed calories is greater than the body spends), diet-related factors, socioenvironmental influence and heredity.

The study found a tendency for obesity among the assessed children. The findings endorse the notion that the childhood obesity has been becoming a public health problem. Overweight and obesity emerge as elements of reflection in daily practice of nutritionists responsible for the diets of pre-school students, as well as a concern among other healthcare professionals of the teams responsible for the direct care of children and their families.

The fifth study[13], conducted in the city of Cajamar, Sao Paulo state, exposes that the proportion of overweight children introduced in the elementary school is high. The authors

suggest that the development of prevention and control measures for the overweight in this age group should involve not only the school institution, but parents or people responsible for the children, since the family environment showed a strong influence over the condition of childhood overweight.

In the sixth study[14], there was a need to perform joined-up interventions from several sectors (school, family, public power, universities), aiming at changing lifestyles, with emphasis on the development of healthier eating habits and regular physical activity practice, given the found overweight magnitude among the student from the city of Pelotas, Rio Grande do Sul state.

• Analytical synthesis of the category

According to the aforementioned, there are many causes and factors that can lead to the childhood obesity. Similarly, the preventive measures also have broad spectrum of activity. The authors highlight the action of healthcare professionals as a very important share with regard to the prevention. To guide parents and children through health education methods is a good way to avoid the obesity.

The nurse's role is to develop within the school environment, through the nursing process, care procedures like the health education, follow-up of the child growth and development, control and prevention of infectious diseases and professional qualification, in order to foster the health promotion of this clientele. [20]

With this, it is possible to ratify that this professional may intervene, through projects focusing on healthy eating, in the health of such children, by seeking the healthy growth and development and maintenance of the appropriate weight for their age. It should also be emphasized the action of the school coupled with healthcare professionals and the public power as a way to prevent when including obesity in the political-educational project planning and when encouraging physical activities, such as the sports practice.

As preventive measures, the accomplishment of national censuses of obesity and the knowledge production by researchers were also cited, in order to inform about this major problem known as childhood obesity.

CONCLUSION

Before the performed survey, it is possible to verify that there is a significant portion of children with an obesity degree in the kindergarten and in the elementary school, as well as the prevalence of this pandemic in several Brazilian regions. The rates are associated with socioeconomic, demographic and bad habits (watching television for long time, soybean oil and soft drinks intake above the recommended).

Based on the above mentioned, it should be confirmed that the obesity is a public health problem, because it is affecting young people and adults, and also children, which could lead to the early onset of diseases, before seen only in people with older ages.

Among the faced challenges for conducting this study, we should highlight the low number of specific publications on the issue in question. It should be of utmost importance that healthcare professionals and nursing students are aware of this issue, aiming at its wider dissemination and understanding, since it is mainly inserted in the field of collective health and performance in primary care, from the childcare until the teenage years, in projects of the Brazilian Ministry of Health. This dynamic reinforces the interdisciplinary nature of the healthcare team, because the nurse is the professional who directs and accompanies new intercurrences, among these, the metabolic-related cases, which could lead to the medical, psychological and nutritional monitoring.

It is suggested the accomplishment of further studies, whose research line is based on teaching methods for the changing eating habits, in order to reduce the presence of overweight in schoolchildren.

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