

EXCESSIVE BODY WEIGHT, BODY FAT, AND EATING HABITS OF STUDENTS FROM PUBLIC AND PRIVATE ELEMENTARY EDUCATION *

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ABSTRACT — **AIMS:** The objective of this study was to evaluate the prevalence of excessive body weight and eating habits among students of 3th and 4th periods of elementary school. **METHODS:** 202 children (87 girls and 115 boys) in four schools (two publics, n=104 and two privates, n=98) from Barra do Garças (MT), Brazil were evaluated. A food frequency and physical activity questionnaire was applied. After measurement of height, weight and body mass index, the body fat (%) was estimated using a bioimpedance scale. The estimation of frequencies and the statistical analysis were performed by the epitools® program. **RESULTS:** Prevalence of both overweight and obesity were higher in private schools compared to the public ones. The prevalence of overweight ranged from 18.92% to 32.43%, whereas the obesity prevalence varied from 18.2% to 36.4%. Body fat distribution was highest among girls than boys. The daily dietary intake of vegetables, legumes and fruits reached only 57.4%, 50% and 43.6%, respectively. 36.6% of the students did not drink or eat milk and its derivatives. The dietary intake of fatty foods and soft drinks 5 to 7 days per week were high, reaching 24.26% and 27.23%, respectively. The weekly consumption of sweets and candies was excessive, reaching 39.11% for 5 to 7 days. **CONCLUSIONS:** obesity was higher among students from private schools and dietary intake of vegetable foods was inadequate, whereas intake of fatty foods, sweets and soft drinks was high.

KEYWORDS — obesity, soft drinks, sedentary lifestyle.

INTRODUCTION

Recent studies have been elucidated that childhood obesity is associated to increased risk of hypercholesterolemia, high blood pressure, non-alcoholic fatty liver disease, and metabolic syndrome in children and adolescents [1–3].

The regular use of electronic devices (tablets, smartphones, games), and the time spent watching TV, raised physical inactivity, consumption of soft and sugary drinks, sleeping problems, and the risk of obesity [4].

Beyond the excessive time spent with sedentary activity, regular intake of energy and fat dense foods constitutes an important factor in determination of overweight and obesity among children and adolescents [5, 6].

It should be emphasized that those unhealthy lifestyles trend to perpetuate, remaining at the adult life and posing an increased risk of obesity and correlated diseases among the adults [6, 7].

Thus, the objective of the present study was to evaluate the prevalence of excessive body weight and eating habits in students from 3^o and 4^o periods of the elementary school in two public and two private schools.

METHODOLOGY

Population and methods

During June to August 2018, 202 children (87 girls and 115 boys), of 3^o and 4^o periods of elementary school in two public and two private schools of Barra do Garças (MT) municipality were assessed.

98 students represented public schools, whereas the remaining 104 belong to private schools in Barra do Garças, MT, Legal Amazonian region.

The heights of children were measured using a portable stadiometer (MD, Brazil). After measurement of height, body weight and total body fat were evaluated by a bioimpedance scale (Tanita, TBF-551, Japan). Values of weight and height were used to calculate body mass index (Kg/m²) of each student. In addition, a food frequency questionnaire was also applied [8].

Ethical and Statistical Aspects

Before engaging the study, participants received full explanations regarding the research and signed the informed consent term. This study is a subsample of the registered study "Epidemiology and risk factors for non-communicable diseases: development and application of a health promotion scale (HPS)" which was approved by the Research Ethics Committee of the "Campus Universitário do Araguaia da Universidade Federal de Mato Grosso (UFMT)" (protocol CAAE: 62989416.1.0000.5587- 2017). The statistical analysis was performed using Epitools® software (Australia). In

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order to correct, standardize and balance the samples by gender, the z-test, in two-tale mode, was applied to compare two proportions. Statistical significant differences were considered when $p < 0.05$.

RESULTS

The prevalence of overweight and obesity were higher in private schools compared to the public ones. The highest prevalence of obesity was found in private school 1. The prevalence of obesity ranged from 18.92% to 32.43%, whereas the prevalence of obesity varied from 18.2% to 36.4% (fig. 1).

The body fat distribution among girls and boys is represented in the fig. 2.

The values of body fat distribution among boys were lower than the values found for girls. Thus, there was major prevalence of body fat values up to 25% among girls, which is considered unhealthy.

Although the weekly dietary intake of legumes, vegetables, and fruits had been considerable, only 57.4%, 50%, and 43.6% of children got a daily ingestion of vegetables, legumes, and fruits, respectively.

The weekly consumption of refined cereals was relatively lower, once 19.3% ingested two to four times/week and 12.4% done for five or more days.

The dietary consumption of meat and its products and milk and dairy reached 82.7% and 63.4%, respectively.

Furthermore, 36.6% of students did not drink milk or eat dairy foods according to nutritional recommendations. In respect of weekly dietary intake of vegetables, 42.6% of the students did not consume the adequate quantities.

The weekly ingestion of fatty foods was also elevated, since the consumption by two to four days, and by five to seven days were 37.13% e 24.26%, respectively.

The dietary intake of sweets, candies and confectionary foods was also excessive, reaching 37.13% and 39.11% for two to four days or five to seven days, respectively.

Another negative aspect was the consumption of soft drinks by the students, once the consumption of those drinks by two to four days and by five to seven days was 49.5% and 27.23%, respectively.

The other aspects of food intake are presented in fig. 3.

The leisure time physical activity practice by the students is presented in the fig. 4.

The frequency of students that did no physical activities was greatest amongst public schools compared to private ones ($p < 0.05$). Notwithstanding, the majority of students (65.91%), independent of school type, did not adequately practice physical activities to maintain health.

DISCUSSION

In the present study, the prevalence of overweight and obesity was greater in private schools compared to the public ones. Furthermore, prevalence of overweight ranged from 18.92% to 32.43%, whereas the prevalence of obesity varied from 18.2% to 36.4%.

Considering the ages of 8 and 9 years old, the prevalence of excessive body weight of the present study was higher even for boys than girls compared with the results found in Umuarama (PR), South Brazil, which ranged from 8.27% (overweight) to 12% (obesity) [9].

Overweight and obesity prevalence of the present study, with 8 and 9 years old students, was higher than that observed by Pinto et al. (2016) [10], with 505 students of 10 to 16 years in Ribeirão Preto (SP), Southeast Brazil. In the same manner, the prevalence of overweight and obesity was higher compared with the observed in Juiz de Fora (MG), Southeast Brazil, with a sample of 403 children, 10 to 14 years old, in which overweight and obesity were 19.9% and 10.2%, respectively [11].

In a research of São Caetano do Sul (SP), with 485 children of 9 to 11 years old, authors observed greater prevalence of overweight (45.4%) and obesity (33%) [12] than reported in the present study.

Regarding the above mentioned studies, the prevalence of excessive body weight of the present study, realized in the inner Mato Grosso (Central-Western Brazil), is so high than São Paulo State, the most developed of Brazil.

The distribution of body fat values among boys was lower in relation to the girls. Thus, there was higher prevalence of girls with body fat values above 25%, which is considered undesirable to health.

Increased body adiposity had been inversely related to cardiorespiratory fitness amongst girls in a study with 1,223 adolescents in the city of Cascavel (PR), South Brazil [13].

At least in part the excessive body weight and adiposity could be explained by unhealthy eating habits.

Therefore, in the current work the adequate daily consumption of vegetables, legumes, and fruits was 57.4%, 50% and 43.6%, respectively.

This consumption of vegetables and fruits of the current work was similar to that observed in 9 to 10 years old students in Coimbra (MG) Brazil [14]. However, the food consumption of the present study was higher than the observed in students of 14 to 19 years old in Sergipe (Northeast Brazil), whose unsuitability of fruits and vegetables intake reached 88.6% [15].

Daily food consumption of meat and its products and milk and dairy was 82.7% and 63.4%, respectively. The elevated meat consumption could also be ob-

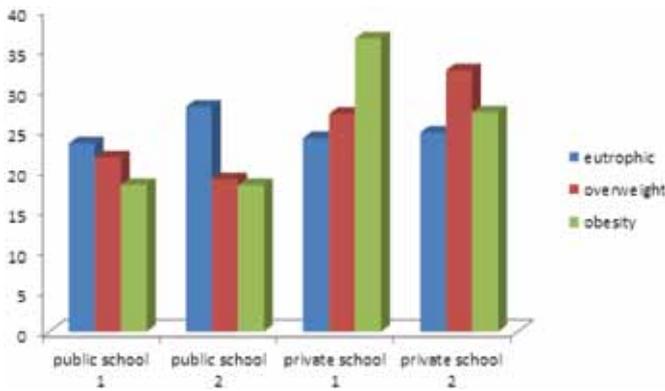


Fig. 1. Prevalence of excessive body weight among children from public and private schools of Barra do Garças (MT), Brazil
* $a \neq b$, com $p < 0.05$

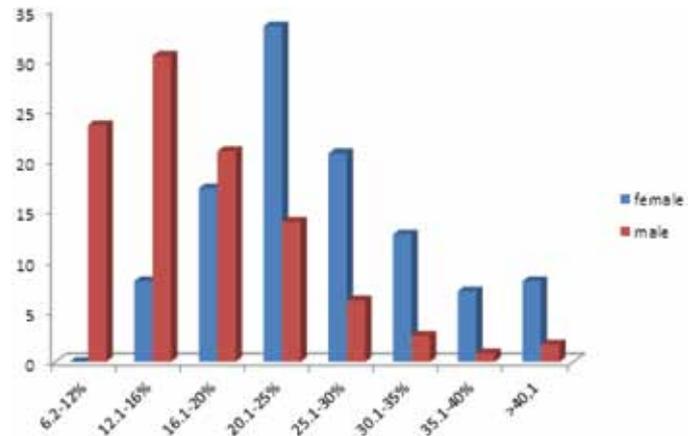


Fig. 2. Distribution of intervals of body fat, according to gender, among children from Barra do Garças (MT), Brazil
* $p < 0.04$

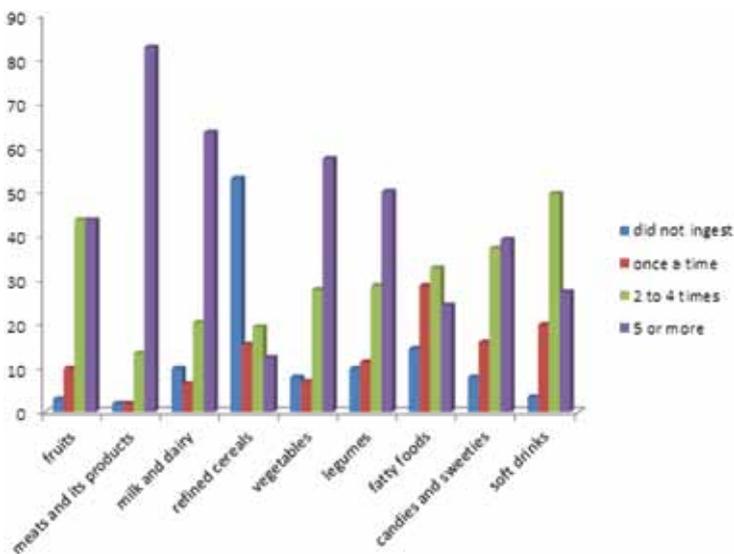


Fig. 3. Food consumption of children from Barra do Garças (MT), Brazil

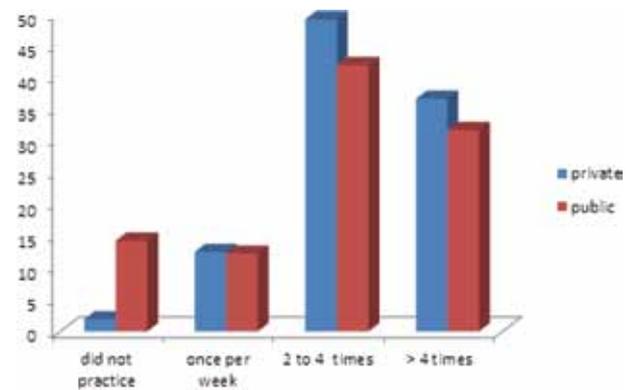


Fig. 4. Weekly frequency of practice of physical activity by students of public and private schools in Barra do Garças (MT), Brazil
* Difference between groups with $p < 0.05$.

served in other studies with children [14–16].

Beyond that, in the current work 36.6% of the students did not drink milk or eat dairy according to nutritional recommendations. This frequency of low milk and dairy intake was major than that observed in the South Brazilian municipality Ipiranga do Sul (RS), which got 20.4% of the students in a municipal school [16].

The weekly ingestion of fatty foods was also elevated, once the consumption of two to four days and of five to seven days was 37.13% and 24.26%, respectively.

Weekly consumption of sweets, candies, and confectionary foods was also excessive, reaching 37.13% and 39.11% for two to four days, or five to seven days, respectively.

A similarly elevated consumption of sweets, candies and confectionary foods was also reported in schoolchildren in many studies in Brazil and in India [10, 16, 17].

A study with children and adolescents in India reported that 61.8% did not ingest leafy vegetables once a week and that the ingestion of fried foods, fatty

foods, sweeties, processed foods, and fast foods is far higher compared to the vegetables and fish intake [17].

Another negative aspect was the drinking of soft drinks by students, since the consumption of two to four days and for five to seven days per week was 49.5% and 27.23%, respectively.

A similar consumption of soft drinks was observed in children of São Paulo (Southeast Brazil) and Rio Grande do Sul (South Brazil) [10, 16], two states with highest prevalence of excessive body weight in Brazil [18].

It is known that children who regularly consume soft drinks have a major trend to consume less fruits and vegetables, practice less physical activity, and present excess of weight [15].

Notwithstanding the consumption of soft drinks which causes physiological problems in the kidney and liver, should be avoided [19].

Beyond unhealthy food habits, the time lost with sedentary activities and absence or insufficiency of regular practice of physical activity constitute other factors associated with increase of body adiposity, overweight, and obesity.

The frequency of students who did no physical activity was higher among those from public schools in relation to those from private schools. However, the majority of students, of both kinds of schools, did not practice physical activities in sufficient quantity to maintain health, which represented 65.91%.

Another study realized with 89 adolescents in many schools of Barra do Garças (MT), presented similar result found in the current study, once 65% of schoolchildren had sedentary behavior [20].

The insufficiency of physical activity observed in the present study was similar to the observed in a study with students of Sergipe (Northeast Brazil), in which 71% of them did not practice the minimum of recommended of physical activity per week [15]. The prevalence of sedentary behavior amongst schoolchildren in Pelotas (RS), South Brazil, was 69.2% [21] similar to the prevalence reported here.

In this way, a study with children demonstrated that short sleep timing, lower practice of physical exercise, and spent too much time in sedentary activities (like sitting, watching television, and using computer and electronic media) considerably enhanced the cardiometabolic risk [22].

Hortj et al. (2014) [23] demonstrated that even the time spent with sedentary activities than the lower time spent with physical activities were associated with increased risk of obesity and metabolic syndrome among 8 to 11 years old children in Denmark.

Finally, the time spent sitting was associated with increased general mortality in a study covering 54 countries [24].

CONCLUSIONS

In the current study performed in the inner Mato Grosso, at the border of Goiás State, the prevalence of both excessive body weight and sedentary behavior were very raised, whereas the intake of sweeties, candies and confectionary foods, and fried foods was also higher, there was a lower ingestion of fruits and vegetables, factors that inspire future concrete actions regarding education and health promotion to schoolchildren.

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