156 - ANTHROPOMETRIC CHARACTERISTICS OF SCHOOLS IN THE MUNICIPAL PUBLIC OF ARAPIRACA, ALAGOAS

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INTRODUCTION

Brazil is characterized by being a country with a large territorial area, presenting a vast discrepancies socioeconomic and cultural factors that result in a significant regional difference (WALTRICK and Duarte, 2000) that expose the need for studies in children and adolescents residing in different regions, with the aim of identifying specific characteristics of the study population (Guedes, 1994; et NAHAS. al. 1992; WALTRICK, 2000, Silva 2002).

Many features can be identified with the use of anthropometry, which is the branch of biological sciences directed to the study of human morphology measurable characters (Sobral and Silva, 1997; Pitanga, 2008), through which one can estimate body composition, being the most used height, total body mass, perimeters, diameters bone and skin folds (LIMA, 2009). It should be noted that in this context, the use of anthropometry in the school environment has contributed to the understanding of human growth and development, enabling the detection of possible abnormalities and / or diseases (FRANCE JR., 1993). The anthropometric method is widely used to identify risk factors related to diseases, but also in the evaluation of maturity and nutritional aspects (Böhmen, 1995; MACHADO & KREBS, 2001; GAYA et al, 2002; BOUCHARD, 2003, Farias & SALVADOR, 2005).

Thus, according to Gouveia (1978), anthropometry is used as a direct method of nutritional assessment through the dimensions of the various parts of the body at different ages, has a low operating cost, it is also possible to investigate variations in physical and extensions in the overall composition of the human body, from individual tests or measurements, allowing an indication of the nutritional status of the population.

In this sense, Waltrick and Duarte (2000) report that the assessment, control and monitoring of body mass, height and body fat, with reference to the growth curves are essential for analysis of human growth, moreover, are evaluation methods doubly indirect, economic and easy to handle.

According to the World Health Organization (1995), the Body Mass Index (BMI) is one of the main population indicators for malnutrition and obesity, being recommended as the basis for studies of anthropometric malnutrition and overweight during childhood and adolescence. The same agency also says that this is an indicator used to check the nutritional variability, which despite its effectiveness, may vary from population to population.

Another anthropometric indicator used is the anatomic waist circumference, which according Sant'Anna et. al. (2009), serves to identify the pattern of regional distribution of body fat, and is justified because of the association between health complications arising from cardiovascular and metabolic disorders and a greater accumulation of fat in central body, regardless of age and the total amount of body fat.

Interventions with children, especially before 10 years of age or adolescence, further reduces the severity of disease, unlike when they are performed only in adulthood, thereby causing substantial changes in risk factors for the emergence of obesity, which is a cause of worldwide concern due to its high prevalence and its relationship to various diseases (Troiano & Flegal, 1998). In this context, Bouchard (2003), emphasizes that it is in childhood and adolescence that should make the diagnosis of body fat, because often these individuals will become obese adults.

Based on the foregoing, the study aimed to evaluate the anthropometric characteristics of schoolchildren of both sexes enrolled in a public school in the city of Arapiraca, Alagoas in 2010, since there are few studies with this population in this region.

METHODOLOGY

This study is a descriptive cross-sectional (Thomas & Nelson, 1996). The sample consisted of 620 children aged 9 years of age, 326 boys and 294 girls, enrolled in a public school in the city of Arapiraca-AL in 2010, present on the day of evaluation and presenting the Statement of Informed Consent (IC) signed by parents or guardians.

This study was approved by the Ethics Committee in Research of the Federal University of Alagoas, with the number of protocol 003360/2011-75.

Since then data collection was conducted between April and June 2010, on school grounds with prior authorization from the same direction.

To evaluate the total body mass (TBM) used a scale Techline® BAL-150Pa, properly calibrated and measured, the accuracy is 100 grams and the scale ranging from 0 to 150 kg. The height (H) was evaluated using a Personal Estadiometer Caprice Sanny®, consisting of a vertical base with a metric scale graduated in centimeters. The waist circumference (PC) anatomy was determined using a Sanny® Metallic Anthropometric Trena, with 200 cm long and 0.1 cm precision. Finally, to determine the relative body fat was used a skinfold caliper Sanny® with up to 65mm range, and accuracy of ± 1mm ² 10g/mm constant pressure on any skin folds. Subsequently, the physical growth was analyzed by means of growth curves of relative height for age and BMI by age proposed by WHO (2007), and recommended by the Ministry of Health of Brazil. BMI (measured in kg / m²) was obtained from the ratio of the MCT, measured in kilograms by the square of EST, measured in meters and is classified by the cutoff points proposed by Conde & Monteiro (2006). For the classification of relative body fat was used the reference tables proposed by Lohman (1987), and finally to the classification of the anatomic waist circumference were taken into consideration the tables proposed by Fernandez et al. al. (2004).

We used the statistic of central tendency (mean, standard deviation, minimum and maximum values) to characterize the sample as a function of the selected variables.

RESULTS

According to the results presented in Table 1 and the curves proposed by WHO (2007), it was found that by age EST (1.34 ± 0.07 m) by age and BMI (16.47 ± 2.75 kg/m2) of male students are standard within the normal range for individuals in the age range evaluated (between P50 and P85). The mean BMI (16.47 ± 2.75 kg/m2) was classified as normal, with reference to the classification proposed by Conde & Monteiro (2006). As the average value obtained for the PC anatomical (58.12 ± 5.78 cm) and taking into account the table proposed by Fernandez et al (2004), establishing percentile values of the risks associated chronic diseases, there that the average value of the schoolchildren is between P25 and P50, classified as low risk. Finally, the mean relative body fat (20.21 ± 8.89%) according to table proposed by Lohman (2007) was classified as optimal.

Even when taking into account the results presented in Table 1 together with the curves proposed by WHO (2007), one can observe that the EST by age (1.35 ± 0.08 m) by age and BMI (16.65 ± 3.06 kg/m2) of female students are within the normal range (between P50 and P85). The mean BMI (16.65 ± 3.06 kg/m2) was classified as normal, with reference to the classification proposed by Conde & Monteiro (2006). As the average value for the PC anatomical (57.44 ± 6.70 cm) and taking into account the table proposed by Fernandez et al (2004), establishing percentile values of risks associated with chronic diseases, there that the average female students is between P25 and P50, classified as low risk. Finally, the mean relative body fat (26.41 ± 10.70%) according to table proposed by Lohman (2007) was classified as moderately high.

Table 1 - Mean values and standard deviation of the anthropometric characteristics of male students (M) and female (F) of a public school in municipal Arapiraca, Alagoas.

	EST (m)	MCT (kg)	IMC (KG/m²)	PC (cm)	%G
M (n=326)	1,34 ±0,07	29,69±6,78	16,47±2,75	58,12±5,78	20,21±8,89
F (n=294)	1,35 ±0,08	30,44±7,67	16,65±3,06	57,44±6,70	26,41±10,70

LEGEND: EST. (height), MCT (total body mass), BMI (body mass index), PC (waist anatomical) G% (relative body fat). Source: Data from own research, 2010

DISCUSSION

It should be noted that the use of the results of this research is limited because it was based on a sample of students of both sexes of a portion of the public schools of the city of Arapiraca, Alagoas (a specific region of our country). Being this way, the results should not be extrapolated to the general population of children and comparison with other studies should be cautious. It is noteworthy that also was not taking into account the dietary habits of the individuals.

The average height of children of both sexes, despite being within the normal range, below are the average values found in the study throughout the country by Silva et al. al. (2010), and also below the average values found in the study was a descriptive cross performed by Waltrick and Duarte (2000) in the state of Santa Catarina.

According to the results obtained and taking into account the height for age curves proposed by the WHO (2007), one can observe that the students of both sexes showed average values within the normal range for the age group evaluated. It is important to report that in another study conducted by Silva (2010) in the city of Arapiraca, with public school children aged 10 to 15 years, average values were observed between P50 and P85, showing that in both studies the students had stature within the normal range according to the curves proposed by WHO (2007). As he performs the monitoring of growth related to age can identify the pattern of growth that is influenced by genetic factors, social and environmental fact which contributes significantly to the creation of both programs, but also strategies to promote health and quality of life of children and adolescents (Diniz et al. al. 2006; PIRES AND SOUZA NETO, 2003, Silva (2010).

When analyzing total body mass of children of both sexes can be seen that the results of this study are comparable to results reported in surveys conducted by Silva et al. al. (2010); Waltrick and Duarte (2000), Soar et. al. (2004), and also next to the data presented by the Brazilian Institute of Geography and Statistics (IBGE, 2008-2009). However, all studies cited have identified a large number of overweight kids.

In relation to the mean values of BMI and considering the BMI curves by age proposed by WHO (2007), can be seen that both the male students as the results of female patients between P50 and P85, considered within the standard normal for the age group evaluated. In a study conducted by Soar et. al. (2004), with children 7-9 years, it was also observed that mean values were between P50 and P85, with a BMI of 16.18 kg / m² to 16.95 kg / m² in boys and 17.13 kg / m² in girls. However, the girls had a BMI greater than the boys, a fact that according to the author of the study can be explained by the early growth observed in females compared to males.

Another survey conducted in Curitiba - Paraná by Mascarenhas et al. al. (2007), with children of 9 year old male, noted that the values were within the normal BMI (17.57 kg / m²), close to the value confirmed by this study. However Gennaro et. al. (2008), emphasizes that BMI can not be used as the parameter to point entirely reliable if the children are really obese, since, in this same study, 12% of boys were considered overweight by BMI, whereas when taking into account the determination of relative body fat (% BF) by measuring skin folds, can be identified that around 33% of children had values above the recommended body fat.

Regarding the anatomic waist circumference, children of both sexes in this study had mean values considered within the normal pattern. In turn, a study by Giuliano and Melo (2004), with children 6 to 10 years in Brasilia, had higher mean values than those obtained in this study, the same, 64.2 cm in girls and 67 4 cm in boys. According Sant'Anna (2009), and Soar et. al. (2004), amounts related to the anatomic waist serve as indicators of health risk justified because of the association between health complications arising from cardiovascular and metabolic disorders and a greater accumulation of fat in central body, regardless of age and total amount of body fat

Regarding the relative body fat, it was observed that the male children had average value classified as normal according to the classification proposed by Lohman (1987). This result corroborates the study by Waltrick and Duarte (2000), which identified similar mean values in children aged 9 years. However, the mean relative body fat of female children in this study was considered moderately high according to the classification proposed by Lohman (1987).

Research conducted by Giuliano and Melo (2004) in Brasilia-DF and Gennaro et. al. (2008) in Londrina, PR, with children 06 to 10 years showed a significant number of children with percentage of fat above the normal range, and the first survey found 33% of boys and girls 25%, while the second survey found that about 20% of boys and 21% of the girls had significantly higher values in relation to relative body fat. However, it is necessary to report that in the present study, in relation to BMI was

found that the levels of excess weight (overweight and obesity) were 29% among girls and among boys 16%, respectively, and compared the relative body fat, it was found that 35% of girls and 25% of boys had considered very high, noting that there are children of both sexes with values above the normal range according to reference tables used, demonstrating the need for conducting periodic evaluations, and also control and monitoring of the sample evaluated in order to verify the changes that come over time.

CONCLUSION

Finally, Souza Neto and Smith (2003) highlight the importance of studies using anthropometric variables, especially with children, because the monitoring and control of the healthy growth reflected in the quality of life of this individual as an adult.

The study concludes that for both sexes evaluated the students are within the normal range for height by age, by age for BMI, waist to anatomical and relative body fat. Therefore, frequent monitoring is needed of the analyzed sample, and also, more studies in order to identify possible causes that contribute to these children may perchance be overweigh.

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ANTHROPOMETRIC CHARACTERISTICS OF SCHOOLS IN THE MUNICIPAL PUBLIC OF ARAPIRACA, ALAGOAS

ABSTRACT

The study aimed to evaluate the anthropometric characteristics of schoolchildren of both sexes enrolled in a public school in the city of Arapiraca-AL in 2010. The sample consisted of 620 schoolchildren of both sexes, aged 9 years, enrolled in a school in the municipal Arapiraca, Alagoas. We measured total body mass and height (to calculate body mass index - BMI), waist circumference as well as anatomical and skin folds. To collect data to utlize a balance Techline BAL-150Pa®, a Sanny stadiometer®, a metal anthropometric tape Sanny® and a skinfold caliper Sanny®. We used the statistic of central tendency. For both sexes the results indicate that schoolchildren are within the normal range for height by age for BMI, waist to anatomical and relative body fat. It is concluded that for both sexes, mean values were within normal range, however, females had higher levels of relative body fat.

KEYWORDS: Anthropometry; school; Obesity.

CARACTÉRISTIQUES ANTHROPOMÉTRIQUES DES ÉCOLES PUBLIQUES DANS LA VILLE DE ARAPIRACA, ALAGOAS

RÉSUMÉ

L'étude visait à évaluer les caractéristiques anthropométriques des écoliers des deux sexes inscrits dans une école publique dans la ville de Arapiraca-AL en 2010. L'échantillon se composait de 620 écoliers des deux sexes, âgés de 9 ans, inscrits dans une école dans la ville de Arapiraca, Alagoas. Nous avons mesuré la masse totale du corps et la hauteur (pour calculer l'indice de masse corporelle - IMC), tour de taille ainsi que plis anatomiques et la peau. Pour collecter des données à l'équilibre utlize BAL-150Pa Techline ®, Sanny stadiomètre ®, Sanny ® ruban métallique anthropométriques et un Adipomètre Sanny ®. Nous avons utilisé la statistique de la tendance centrale. Pour les deux sexes indique que les résultats sont les écoliers dans la fourchette normale pour la taille par âge pour l'IMC, tour de taille à la graisse corporelle anatomique et relative. Il est conclu que c'est les deux sexes, les valeurs moyennes étaient dans la fourchette normale, cependant, les femmes avaient des niveaux plus élevés de graisse du corps parent.

MOTS-CLÉS: Anthropométrie; école; obésité.

LAS CARACTERÍSTICAS ANTROPOMÉTRICAS DE LAS ESCUELAS PÚBLICAS EN LA CIUDAD DE ARAPIRACA, ALAGOAS

RESUMEN

El estudio tuvo como objetivo evaluar las características antropométricas de los escolares de ambos sexos matriculados en una escuela pública en la ciudad de Arapiraca-AL en el 2010. La muestra consistió en 620 escolares de ambos sexos, de 9 años, se inscribió en una escuela en la ciudad de Arapiraca, Alagoas. Se midió la masa corporal total y la altura (para calcular el índice de masa corporal - IMC), circunferencia de la cintura, así como los pliegues anatómicos y la piel. Para recopilar los datos de la balanza utlize BAL-150Pa Techline ®, Sanny estadiómetro ®, Sanny ® cinta de metal antropométricas y una pinza de pliegues cutáneos Sanny ®. Se utilizó la estadística de tendencia central. Para ambos sexos indica que los resultados son los escolares dentro del rango normal para la talla por edad para el IMC, cintura, la grasa corporal anatómica y relativos. Se concluye que es ambos sexos, los valores medios estuvieron dentro del rango normal, sin embargo, las mujeres tenían mayores niveles de grasa corporal relativa.

PALABRAS CLAVE: Antropometría, escuela, obesidad.

CARACTERÍSTICAS ANTROPOMÉTRICAS DE ESCOLARES DA REDE PÚBLICA MUNICIPAL DE ARAPIRACA, ALAGOAS

RESUMO

O estudo teve como objetivo avaliar as características antropométricas de escolares de ambos os sexos, matriculados em uma escola pública municipal na cidade de Arapiraca-AL no ano de 2010. A amostra constituiu-se de 620 escolares de ambos os sexos, com 9 anos, matriculados em uma escola da rede municipal de Arapiraca, Alagoas. Foi mensurada a massa corporal total e estatura (para cálculo do Índice de Massa Corporal – IMC), além de perímetro da cintura anatômica e dobras cutâneas. Para coletar os dados utlizou-se uma balança Techline BAL-150PA®, um estadiômetro Sanny®, uma fita antropométrica metálica Sanny® e um compasso de dobras cutâneas Sanny®. Utilizou-se a estatística de tendência central. Para ambos os sexos os resultados identificaram que os escolares avaliados se encontram dentro do padrão de normalidade para a estatura pela idade, para IMC, para perímetro da cintura anatômica e gordura corporal relativa. Conclui-se que para ambos os sexos, os valores médios encontram-se dentro níveis de normalidade, no entanto, as meninas apresentaram níveis mais elevados de gordura corporal relativa.

PALAVRAS-CHAVE: Antropometria; escolares; Obesidade.