155 - EVALUATION OF THE PERCENTAGE OF BODY FAT OF THE CITY OF SCHOOL ARAPIRACA/ALAGOAS

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INTRODUCTION

The juvenile phase is characterized by several body changes, among which is the accumulation of subcutaneous fat in both genders. If this accumulation is not controlled, the child becomes predisposed to obesity and its comorbidities is not controlled. Under the terms of primary healthcare, there is need for improving the prognosis and diagnosis based on the evaluation performed for a body control over the appearance of excessive body fat and predisposition to cardiovascular disease as well as the systemic imbalances, according to Daniels SR. et al. (2005).

Childhood and adolescence are periods for primary diagnosis of body composition and to be diagnosed above the reference values of these individuals will increase the likelihood of becoming obese adults in the future, says Fisberg RM, et al. (2005).

To the Federal Council of Physical Education (2010) and Bouchard C. (2003), the assessment of body composition is composed of the variables body mass, height, waist, hip and abdomen, Body Mass Index (BMI), fat percentage (% G). Thus, the percentage of fat is an important parameter and should be evaluated observing parameters of appropriateness for the genders, male and female, with respect to the level of body fat provided by the evaluator.

In this context, Guedes and Guedes (2006) state that the skinfold technique is widely used to determine body composition in different types of people, as a technique of low operating costs and to be widespread in scientific circles.

According to Wilmore and Behnke (1969), skinfold measurements provide information about the constant and significant body fat and its distribution. The American College Sports Medicine (2006) states that "the calculation of body fat percentage using skinfold thickness provides more precise estimates of BMI in contrast, consists of direct measurements of subcutaneous fat."

The epidemiological investigations are needed to estimate body fat showing obesity and central fat excess in childhood. These factors favor an increase in blood pressure and chronic degenerative diseases. In addition to the American College Sports Medicine (2006) there are likely about the imbalance of the metabolic system, and also burdens the joints. Due to this overload is commonly reported pain, excessive muscle tension, difficulty walking, among others.

From this premise, this study aimed to evaluate the fat percentage of students aged 9 to 14 years old the city of Arapiraca/Alagoas.

METHODOLOGY

It is a cross-sectional descriptive study with quantitative approach, according to Hart and Bervian (1996). The study was approved by the Ethics Committee in Research of Universidade Federal de Alagoas 003360/2011-75 protocol number.

The study sample occurred in a aleotória simple. The study excluded those who did not have school aged 9 to 14 years of age who were not enrolled in 2010, and also those who did not deliver the Statement of Informed Consent (IC) signed by the parent or guardian.

For purposes of sample size calculation, we used the following parameters: population of approximately 10,182 subjects, a confidence level of 95%; tolerable sampling error of 1.4%, for not knowing the exact extent of the problem in focus in the study population the estimated prevalence was awarded in 50% and design effect once the minimum sample size. This would represent a minimum sample of 3308 subjects. Established for such purpose, 5% more than minimum evaluative chips (509) for possible losses. However, the number of subjects according to the Software SampleXS sufficient to meet the study was 3817 students. However, the sample comprised 3,918 students enrolled in 10 schools in the urban area of Arapiraca in 2010, aged 9 to 14 years.

The skinfold measurements of the subjects were made using calipers Sanny ® Portable with a precision of 0.1mm. The values of relative body fat (% BF) were classified as proposed by Lohman (1987).

For the measurement of skin folds and subscapular tricciptal, we used the protocol described in Petroski (2003).

To assess the relative body fat of children of both sexes, we used the protocol proposed by Lohman (1992).

Data analysis of the study program EpiData was used in the information document preset to control the data in each field entered by the researcher in order to reduce typing errors.

For data processing we used the statistical central tendency (mean and standard deviation) with the help of Epi Info.

RESULTS

Of the 3918 schoolchildren aged 9 to 14, 1921 were male (49.03%) and 1,997 females (50.97%). The members of the sample were separated taking into account gender and chronological age. The results and the classification are shown in Tables 1 and 2 below.

According to Table 1, it appears that the school boys aged 9-14 years had moderately high level of relative body fat (% BF) with average values between 25 and 20.40 +7.42, 39 +12.40.

Table 1. Mean values and derivatives of relative body fat (% BF) of male students enrolled in public schools in Arapiraca-AL - 2010.

AGE	n	FAT PERCENTAGE*	RATING**
9 Years	306	20,40±7,42	Moderately High
10 Years	381	22,87±10,19	Moderately High
11 Years	332	24,35±10,73	Moderately High
12 anos	Years	24,94±11,69	Moderately High
13 anos	Years	25,39±12,40	Moderately High
14 anos	Years	22,47±7,57	Moderately High

(Average/ ** Rating on the protocol of Lohman, 1992). Source: Data from own research, 2010.*

According to the results presented in Table 2 shows that female students aged between 10 and 13 years had moderately high level of relative body fat (% BF) with mean values between 26.54 and +9.76 30.73 +11.51. In turn, the school at the age of 14 years showed high level of relative body fat (% BF), averaging 36.63 +12.89. Finally, only the school at the age of 9 years of age had an average value of relative body fat (% BF) considered optimal (23.16 +8.99).

Table 2. Mean values and derivatives of relative body fat (% BF) of female students enrolled in public schools in Arapiraca-AL - 2010.

AGE	n	FAT PERCENTAGE *	RATING **
9 Years	296	23,16±8,99	Optimum
10 Years	360	26,54 ± 9,76	Moderately High
11 Years	408	29,67±11,31	Moderately High
12 Years	402	27,03±11,33	Moderately High
13 Years	327	30,73±11,51	Moderately High
14 Years	204	36,63±12,89	High

*(*Average/ ** Rating on the protocol of Lohman, 1992).*
Source: Data from own research, 2010.

DISCUSSION

The results did not take into account the genetic, biological maturation, socioeconomic status, menarche and eating habits, a fact considered as a limitation of the study.

It should be noted that Daniels et al (2005) and the American Obesity Association (2005) stated that the prevalence of high levels of fat among children and adolescents has appeared increasingly in recent decades and is considered a public health problem.

In a study by Gonçalves and Gonzaga (2003) carried out with 1,666 schoolchildren between 7 and 17 years found a high percentage of children and adolescents of both sexes (35.9%) were obese (moderately high, high, very high), 38 5% in females and 33.8% in males.

Although this study to analyze the relationship between fat percentage and blood pressure in school, were found inadequate values where classes moderately high, high and very high values have elevated blood pressure with 22.6% considered borderline, 50.8% had hypertension for systolic blood pressure (SBP). In diastolic blood pressure (DBP) 28.7% of students have classified borderline hypertensives and 30.4%. It can be noted in this study the overall health of the juvenile phase is fraught with high cases of obesity and hypertension and the association between these cases for the predisposition to cardiovascular disease. Therefore, in our study the students mostly have high level of fat percentage becomes a factor that shows a predisposition to cardiovascular problems.

When considering the levels of human development, Human Development (2011), developed countries like the United States and Spain (0.902 and 0.863, respectively), and Brazil, a developing country (0.699) can be verified that the results obtained study by Gonçalves and Gonzaga (2003) serve as a warning to the relative excess of body fat in childhood and adolescence, both in developed and developing countries. Ratifying the increased levels of overweight and obesity during childhood and adolescence worldwide.

The increasing prevalence of overweight in varying degrees in the child population is observed in various parts of the world and has repercussions on the health status and quality of life for children portrays Must (1996).

Gonçalves and Gonzaga (2003) argue that there is a prevalence of high levels of relative percentage of fat (% BF) in studies by Silva et al. al in the cities of Recife (Pernambuco) and Ponta Grossa (PR) in schoolchildren of public schools.

In studies of Gonçalves and Gonzaga (2003), Bergmann et al. (2008), McCarthy et. al (2008), Aral et al. (2007), who assessed the relative body fat (% BF) in children and adolescents, similar results were found with high levels of fat percentage of equal concern to the findings in this study. In the studies cited were observed prevalence of overweight and obesity in middle school. However, they present different cutoff levels to identify high relative percentage of fat (% BF) pointing out that comparisons should be interpreted with caution. But despite the differences between the reference classification may be noted that there is a likelihood of rising school with high levels of relative fat percentage (% G) these studies can serve as a warning to public health.

The average values of relative body fat made by female students in all age brackets were higher when related to the mean values for male students. However, when taking into account the classification proposed by Lohman (1992) can be observed that the levels of obesity were similarly rated between girls and boys between 10 and 13 years ("moderately high"). On the other hand, the 9 and 14 years of age, mean girls were classified as "good" and "high", respectively, while among boys the classification was "moderately high" in both age groups.

This can be explained by the influence of female sex hormone, estrogen, which develops body changes with increasing relative body fat not pathological, according to Guyton and Hall (2006). Therefore, for this reason there are different classifications of references for both sexes.

It was observed that in all age groups, except for 9 years in females, had higher percentage of high fat. This reinforces the need for monitoring physical activity and nutrition in order to reduce the body fat percentage. According to Souza Neto and Smith (2003), this would result in reducing the likelihood of the emergence of chronic degenerative diseases.

The physical characteristics can be modified depending on multiple factors, including lifestyle habits, dietary habits and physical activity level portray Guedes and Guedes (2006).

Therefore, a good school environment is of paramount importance in educational activities, especially physical education, where this, through its programs, could contribute to an educational background focused on health promotion and consequently reducing the incidence of factors risk that could lead to the emergence of organic disorders says the Federal Council of Physical Education (2010).

The differences in the methods and sample sizes of studies complicate interpretation of the best school in the trend of

high levels of body fat in age from 9 to 14 years of age in different regions of Brazil. Nevertheless, one can observe that there is a trend of gradual increase in the percentage of fat in school.

CONCLUSION

Were verified high levels of relative body fat in both sexes in most age groups assessed. However, one can observe that only aged 9 years female presented with "optimum level" relative body fat. It is therefore essential control over the daily habits of schoolchildren, including: physical activity and nutrition in order to prevent the premature onset of cardiovascular disease due to the high rates reported in the study.

REFERÊNCES

AMERICAN COLLEGE OF SPORTS MEDICINE (ACSM) Guidelines for exercise testing and prescription. Philadelphia: Lippincott Williams & Wilkins, 7nd ed., 2006.

AMERICAN OBESITY ASSOCIATION. Fast facts - obesity research. [Web Site]. 2005. Disponível em www.obesity.org/subs/fastfacts/Obesity_Research.html.

ARAI, et. al. Adiposity, physical activity, and physical fitness among children from Aragón, Spain. Obesity. 2007; 15(8):1918-1924.

BERGMANN GG, et al. Influência da Idade e de Variáveis Antropométricas no Desenvovimento da Força de Resistência em Escolares: Um estudo Longitudinal. Rev. Ciência e Conhecimento. 2008; 3(3):1-11.

BOUCHARD C. A epidemia de obesidade. In: Bouchard C. (ed). Atividade física e obesidade. Barueri: Manole, 2003.

CERVO AL, BERVIAN PA. Metodologia Científica. 4 ed. São Paulo: Makron Books do Brasil Editora, 1996. p.49-50.

CONSELHO FERAL DE EDUCAÇÃO FÍSICA (CONFEF). Carta Brasileira de Prevenção Integrada na Área da Saúde. Disponível em <http://www.confef.org.br/extra/conteudo/default.asp?id=30> [2010 dez 19].

DANIELS SR, et.al. Overweight in children and adolescents: pathophysiology, consequences, prevention, and treatment. Circulation. 2005; 111(15):1999-2012.

FISBERG RM, et al. Estado nutricional e fatores associados ao déficit de crescimento de crianças freqüentadoras de creches públicas do Município de São Paulo, Brasil. Cad Saude Publica 2005;20: 812-7.

GONÇALVES KB, GONZAGA WRR. Amostra probabilística dos índices de sobrepeso e obesidade infantil em uma escola da rede pública municipal da cidade de Ponta Grossa. Jornada científica de educação dos Campos Gerais, n1., 2003.

GUEDES DP, GUEDES JERP. Manual prático para avaliação em educação física. 1 ed. São Paulo: Editora Manole Ltda; 2006.

GUYTON AC, HALL JE. Tratado de fisiologia médica. 11ª ed. Rio de Janeiro: Guanabara Koogan, 2006.

HUMAN DEVELOPMENT. Index and its components. 2010. Disponível em: <http://hdr.undp.org/en/media/HDR_2010_EN_Table1.pdf> [2011 mar 21].

LOHMAN TG. The use of skinfold to estimate body fatness on children and youth. 1987; 58(9):98-103.

LOHMAN TG. Advances in body composition assessment. Champaign, Human Kinetics Publishers. 1992.

MCCARTHY WJ, et. al. Correlation of obesity with elevated blood pressure among racial/ethnic minority children in two Los Angeles middle schools. Prev Chronic Dis. 2008; 5(2):46.

MUST A. Morbidity and mortality associated with elevated body weight in children and adolescents. Am J Clin Nutr 1996; 63(3):445- 7.

PETROSKI EL. Antropometria: técnicas e padronizações. Porto Alegre: Gráfica Editora Palotti; 2003.

SOUZA FS, PIRES NETO CS. Crescimento Estatural de Crianças na Faixa Etária de 11 e 12 anos. Revista Brasileira de Cienantropometria & Desempenho Humano, 2003; 5(1):39-45.

WILMORE JH, BEHNKE AR. An anthropometric estimation of body density and lean body weight in young men. Journal of applied Physiology. 1969; 27(1): 25-31.

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ABSTRACT

The aim of this study was to evaluate the fat percentage of students aged 9 to 14 years oldthe city of Arapiraca / Alagoas. Transversal study with descriptive and quantitative approach with a sample of 3,918 students enrolled in 10 schools in the urban area of Arapiraca. Wecollected the values for the subscapular skinfold and triceps, and thencalculated the percentage of fat (% BF) using the protocol proposed by Lohman (1992).The results showed high levels of fat percentage of students in both sexes, except for theage of 9 years in females, classified as optimal. It is worth emphasizing the need forcontrol over the daily habits of the students in order to reduce the levels of relative body fat,thereby contributing to reducing the risk of onset of chronic-degenerative and cardiovascular prematurely due to the high rates presented in the study.

KEYWORDS: Fat, School, Assessment.

ÉVALUATION DU POURCENTAGE DE GRAISSE CORPORELLE DE LA VILLE DE L'ÉCOLE ARAPIRACA/ALAGOAS

RÉSUMÉ

Le but de cette étude était d'évaluer le pourcentage de graisse des élèves âgés de 9 à 14 ans la ville d'Arapiraca oldthe / Alagoas. Étude transversale avec l'approche descriptive et quantitative sur un échantillon de 3918 étudiants inscrits dans 10 écoles de la zone urbaine de Arapiraca. Wecollected les valeurs pour le pli cutané sous-scapulaire et du triceps, et thencalculated le pourcentage de matières grasses (% MG) en utilisant le protocole proposé par Lohman (1992). Les résultats ont montré des niveaux élevés de pourcentage de graisse des étudiants dans les deux sexes, sauf pour theage de 9 ans chez les femelles, classés comme optimale. Il convient de souligner l'forcontrol besoin au cours des habitudes quotidiennes des élèves afin de réduire les niveaux de graisse du corps parent, contribuant ainsi à réduire le risque de survenue d'dégénératives chroniques et cardiovasculaires prématurément en raison de taux élevés présentés dans l'étude.

MOTS-CLÉS: gras, école, évaluation.

EVALUACIÓN DEL PORCENTAJE DE GRASA CORPORAL ESCOLAR DE LA CIUDAD ARAPIRACA/ALAGOAS
RESUMEN

El propósito de este estudio fue evaluar el porcentaje de grasa de los estudiantes de 9 a 14 años de la ciudad de Arapiraca oldthe / Alagoas. Estudio transversal con enfoque cuantitativo descriptivo y una muestra de 3.918 estudiantes en 10 escuelas de la zona urbana de Arapiraca. Wecollected los valores de los pliegues cutáneos subescapular y tricipital, y thencalculated el porcentaje de grasa (% GC) utilizando el protocolo propuesto por Lohman (1992). Los resultados mostraron altos niveles de porcentaje de grasa corporal de los alumnos de ambos sexos, a excepción de Theages 9 años en las mujeres, clasificados como óptimos. Cabe destacar la necesidad de forcontrol en los hábitos diarios de los estudiantes con el fin de reducir los niveles de los padres de la grasa corporal, ayudando a reducir el riesgo de sufrir enfermedades crónicas degenerativas y cardiovasculares antes de tiempo debido a los altos índices presentados en el estudio.

PALABRAS CLAVE: evaluación de la grasa, en la escuela.

AVALIAÇÃO DO PERCENTUAL DE GORDURA CORPORAL DE ESCOLARES DO MUNICÍPIO DE ARAPIRACA/ALAGOAS
RESUMO

O objetivo deste estudo foi avaliar o percentual de gordura dos escolares na faixa etária de 9 a 14 anos de idade do município de Arapiraca/Alagoas. Estudo de caráter transversal com natureza descritiva e abordagem quantitativa, com amostra de 3.918 escolares matriculados em 10 escolas na zona urbana do município de Arapiraca. Foram coletados os valores referentes as dobras cutâneas subescapular e tríceps braquial, e posteriormente, calculados os percentuais de gordura (%G) através do protocolo proposto por Lohman (1992). Os resultados apresentaram níveis altos de percentuais de gordura dos escolares em ambos os sexos, com exceção da faixa etária de 9 anos no sexo feminino, classificado como nível ótimo. Vale ressaltar a necessidade do controle sobre os hábitos do cotidiano dos escolares com o intuito de reduzir os níveis de gordura corporal relativa, contribuindo dessa forma, para a redução dos riscos de surgimento de doenças crônico-degenerativas e cardiovasculares de forma prematura decorrentes dos altos índices apresentados no estudo.

PALAVRAS-CHAVE: Gordura, Escolares, Avaliação.