132 - BEHAVIOR OF INDICES OF OBESITY AND ADIPOSITY IN SCHOOL OF BOTH SEXES OF THE CITY OF AL-ARAPIRACA IN DIFFERENT AGE GROUPS.

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INTRODUCTION

The excessive increase in levels of childhood obesity has characteristics of an epidemic and has caused a great impact on health spending worldwide (and Fisberg OLIVEIRA, 2003).

This fact is of a concern because the association of obesity with metabolic abnormalities considered as risk factors for the development of type 2 diabetes mellitus and cardiovascular disease, a few years ago was more evident in adults, which today can be seen in young (Matos and Oliveira, 2004).

There are several methods for evaluating the accumulation and distribution of body fat, and can be direct, indirect and doubly indirect. Among the doubly indirect methods there is the anthropometry which is widely used to examine the variations of the physical dimensions and overall composition of the human body, from individual measurements or tests (Lukaski, 1987). There are also several indicators used to determine levels of obesity. One of these indicators is the relationship between weight and height, but no reviews to tables that correlate height and weight because they do not represent a reliable assessment of body fat, since they can classify overweight individuals with loads muscle mass and stature (Vasconcelos and ADAMI, 2008).

Another indicator used is the Body Mass Index (BMI), the problem is that BMI has some limitations among them the fact that this index does not separate the fat mass of fat-free mass, and may be thus an inadequate estimate of changes in body compartments (Kyle et. al. 2004). However, studies in large population samples have shown high correlation between BMI and body fat, and more importantly, the increased mortality risk associated with high BMI (Monteiro et al., 2000).

Currently there are suggestions for using another indicator called the Body Adiposity Index (TCI), which can be used to reflect the percentage of body fat for men and women alike, and different ethnicities without numerical correction. However, these authors note that due to the increasing rise of childhood obesity, it is essential to analyze the behavior of the IAC in prepubescent and post-pubescent in both sexes and ethnicities, as well as replicate the study in other populations (BERGMAN et al., 2011).

Based on the above objective was to verify the indicators of obesity of schoolchildren aged 9 to 14 years old in the city of Arapiraca/Alagoas.

MATERIAL AND METHODS

Population

The sample consisted of 3914 students of both sexes, with ages 9-14 years, with 1919 males and 1995 females, randomized, enrolled in 2010 schools in the municipal schools of Arapiraca -AL. This study was approved by the Ethics Committee of the Universidade Federal de Alagoas, with the number of protocol 003360/2011-75.

Procedures. To determine the total body mass, we used a scale Techline ® BAL-150PA, properly calibrated and tested, the accuracy of which is 100 grams and the scale ranges from 0 to 150 kg. Height was measured using the Personal Estadiometer Caprice Sanny ®, whose pre-split is 1 mm, consisting of a vertical base with a metric scale graduated in centímetros.

The procedures for the measurement of total body mass and height followed the protocols proposed in Alvarez and Pavan (2003). To measure the circumference of the hip was used a metal anthropometric tape Sanny ®, with 200 inches in length and 0.1 cm accuracy. To measure the perimeters of the hip-tro we used the protocol proposed in Norton et al. (2005).

Anthropometric measurements of skinfolds of schoolchildren were performed with the use of portable adipometer Sanny ® with accuracy of 0.1mm. We measured the skinfolds and subscapular skinfold according to procedures proposed by Lohman (1992).

Later, the data were used for the determination and classification of body mass index (Cole et al., 2000), Body Adiposity Index (BERGMAN et al., 2011), and Body Fat Relative (LOHMAN, 1992).

RESULTS

As shown in Figure 1, where the observed relative body fat (% BF) between the sexes by age, it appears that females exhibit higher values than males in all age groups. It is evident that the values of relative body fat in women are rising from 9 to 11 years, reduced to 12 years and increasing again up until 14 years of age. Already in boys, the values of relative body fat are rising from 9 to 13 years, but at age 14 there is a decrease.

Figure 1. Behavior of relative body fat among school children of both sexes at different ages.

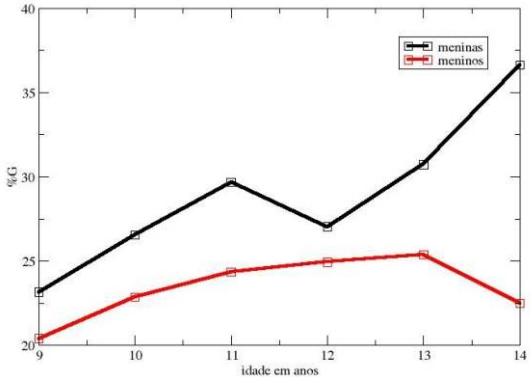


Figure 2 demonstrates that girls had higher mean BMI than boys in all age groups. It should be noted that there is a marked increase among girls 9-10 years, some stability back to 11 years and to rise from 12 years to 14 years of age. Since the mean values of male students remains with continued growth of 9 to 14 years old.

Figure 2. Mean values of body mass index (BMI) on both sex by age group.

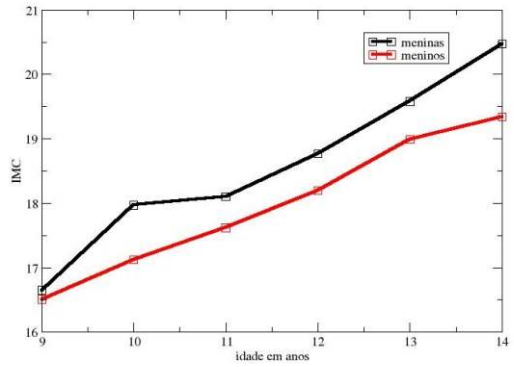
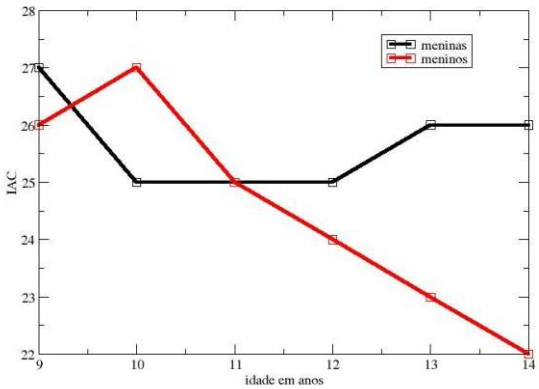


Figure 3 shows that female students have ACT values greater than male students from the age of 11. For females there is a reduction in the IAC from 9 to 10 years, then a stabilization occurring from 10 to 12 years, returning to rise to 13 years and stabilize at 14 years of age. Since the boys have increasing values of IAC between 9 and 10 years, and then present a continuous reduction from 10 to 14 years.

Figure 3. Mean values for the Body Adiposity Index (TCI) on gender by age group.



DISCUSSION

It should be noted that the study had limitations as the fact of not taking into account factors that influence levels of obesity, including: genetic, biological maturation, socioeconomic status, menarche, eating habits, among others.

The behavior of the results presented in different age groups for females can be partly explained in terms of girls accumulate higher amount of body fat, in parallel with an increase in the amount of gonadotropic hormones in stages prior to menarche (Kaplowitz, 2008) . A study by Pasquarele et al. (2010), in São José dos Campos SP, which aimed to analyze the anthropometric variables and the prevalence of overweight according to stages of sexual maturation up-and chronological age in school from 10 to 12 years of both sexes showed in their results that the process of sexual maturation interfere differently in the prevalence of overweight boys and girls.

The study by Vasconcelos and Adami (2008) found the relationship between sexual maturation pre-scratch and changes in anthropometric variables in adolescents 10 to 14 years. According to Wang (2002), a survey of North American - NHANES III - identified early in the development of male sexual characteristics, compared to previous generations, however, found a negative relationship between obesity and sexual maturation. Kaplowitz et al. (2008) emphasize that the relationship between obesity and early puberty in boys is not yet fully elucidated due to the small number of studies that have addressed the

issue and because there is no convincing marker for male puberty, as is the case at menarche for girls. Regarding the age of the students evaluated in this study, an association was found between the increase in chronological age and decrease excess body fat in boys compared to IAC. In turn, the other indicators (BMI and% BF) this behavior was found in the age groups 13 to 14 years. However, for girls, the prevalence of overweight was similar in all age groups.

According to Dietz (1997), there are three critical periods for the development of obesity, the first occurring in the last trimester of pregnancy, the second between 6-8 years and the third in adolescence due to early sexual maturation.

The period of 6 to 8 years is known as adipose rebound (ROLLAND-CACHERA et al, 2002). Based on this statement the children of 8 years who have high rates of obesity may be more exposed to serious weight loss in adulthood once, about 80 to 86% of adult obesity originates in childhood (POLLOCK, 1993). Thus, high rates of obesity found between 9 and 10 years show the importance of greater care in relation to weight gain in infancy, as to Dietz (1997), from 6 years of age the excess weight does not disappear spontaneously. For Clerk et. al. (2000), occurs the earlier the fitting body fat favoring greater for its continuity over the years. Lazzolli et. al., (1998) report that adopting healthy habits such as physical activity is an important factor since childhood, because at this stage, among the goals of your prescription are creating the habit and interest early, and try to avoid increasing body fat.

Study developed Gutin et. al., (2003), showed that boys are apparently more active than girls, a fact that may be linked to social contexts.

Sallis (1993), reports that the difference in physical activity levels between boys and girls occurs in about 15% over age. For Lazolli et. al., (1998) advancing age may be accompanied by a decline in physical activity, and consequently a lower energy expenditure and may be influenced by several factors including: social behaviors and student commitments.

Moreover, with regard to overweight or may not be related to physical activity is still unknown, but the possible influence for this correlation may be associated with the maturational status of children, since according to Guedes and Guedes (2006), during the first decades of life the organism undergoes strong influence of maturational status, which may favor the increased weight and consequent decline in physical activity.

CONCLUSION

We conclude that among the male students there were different classifications between BMI and% BF in the age groups evaluated, there is agreement only among boys under 13. Moreover, the% G and IAC had similar ratings in all age groups. Among the IAC and BMI were observed similar ratings only in individuals of 13 years, which shows that the three indicators presented concerning classification concordance among boys.

In females, the classifications of% BF and BMI are similar between 9 and 14 years but differentiated ratings were verified in other age groups. The% G and IAC had similar ratings among schoolchildren aged 9 years, but in other age groups there were different classifications among these variables. By analyzing the average values of the IAC and BMI was found that the classification of both resemble among girls aged 9, which demonstrates, once again, indicating that the three also showed relative agreement among girls.

Finally, we point out that it is essential to conduct further studies aimed at evaluating these indicators in different groups with different ages, and also for studies that focus on verifying the existence of correlation between these indicators of obesity.

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BEHAVIOR OF INDICES OF OBESITY AND ADIPOSITY IN SCHOOL OF BOTH SEXES OF THE CITY OF AL-ARAPIRACA IN DIFFERENT AGE GROUPS.

ABSTRACT

The aim of this study was to determine the indicators of obesity of schoolchildren aged 9 to 14 years old in the city of Arapiraca/Alagoas. This study has a cross-sectional descriptive and quantitative approach with a sample of 3918 students enrolled in 10 schools in the urban area of the city of Arapiraca. We collected the amounts related to subscapular skinfold, triceps, height, total body mass, hip circumference, and subsequently calculated the percentage of fat (% BF) using the protocol of Lohman (1992), by BMI classification proposed by Cole et.al. (2000), and IAC through the classification proposed by Bergman et al. (2011). We used the statistical central tendency. As for the mean values of relative body fat results were classified, mostly in both boys and girls, as moderately high. Regarding BMI, the average scores were classified mostly as normal for both sexes. Finally, the average values of the IAC for males, most were classified as overweight, while for females in all age groups analyzed were classified as normal. The study concludes that there is a difference between the proposed classifications of relative body fat (% BF), BMI and IAC, showing that it is essential to conduct further studies that can verify the existence of correlation between the variables.

KEYWORDS: Indices of obesity, Body Adiposity; School.

COMPORTEMENT DES INDICES DE L'OBÉSITÉ ET L'ÉCOLE DE ADIPOSITÉ CHEZ LES DEUX SEXES DE LA VILLE D'AL-ARAPIRACA DIFFÉRENTS GROUPES D'ÂGE.

RÉSUMÉ

Le but de cette étude était de déterminer les indicateurs de l'obésité des écoliers âgés de 9 à 14 ans dans la ville de Arapiraca/Alagoas. Cette étude a adopté une approche transversale à visée descriptive et quantitative auprès d'un échantillon de 3918 étudiants inscrits dans les 10 écoles de la zone urbaine de la ville de Arapiraca. Nous avons recueilli les montants liés aux sous-scapulaire du pli cutané, les triceps, la taille, la masse corporelle, la circonférence totale de la hanche, et par la suite calculé le pourcentage de matière grasse (% MG) en utilisant le protocole de Lohman (1992), par classification de l'IMC proposé par Cole et al (2000), et de l'IAC par la classification proposée par Bergman et al. (2011). Nous avons utilisé la tendance statistique central. En ce qui concerne les valeurs moyennes des résultats relatifs graisse corporelle ont été classés, surtout chez les garçons et les filles, comme modérément élevé. En ce qui concerne l'IMC, les scores moyens ont été classés la plupart du temps comme d'habitude pour les deux sexes. Enfin, les valeurs moyennes de la CCI pour les hommes, la plupart ont été classés comme étant en surpoids, tandis que pour les femmes dans tous les groupes d'âge analysés ont été classés comme normale. L'étude conclut qu'il existe une différence entre les classifications proposées de graisse corporelle relative (% MG), l'IMC et de l'IAC, montrant qu'il est essentiel de mener des études complémentaires qui peuvent vérifier l'existence d'une corrélation entre les variables.

MOTS-CLÉS: Indices de l'adiposité du corps obésité, scolaires.

COMPORTAMIENTO DE LOS ÍNDICES DE OBESIDAD Y ADIPOSIDAD EN ESCOLARES DE AMBOS SEXOS DE LA CIUDAD DE AL-ARAPIRACA EN DIFERENTES GRUPOS ETARIOS.

RESUMEN

El objetivo de este estudio fue determinar los indicadores de obesidad de escolares de entre 9 y 14 años de edad en la ciudad de Arapiraca/Alagoas. Este estudio tiene un enfoque transversal descriptivo y cuantitativo con una muestra de 3.918 estudiantes matriculados en 10 escuelas de la zona urbana de la ciudad de Arapiraca. Se obtuvieron los montos relacionados con pliegue subescapular, tricipital, la altura, la masa corporal total, circunferencia de cadera y posteriormente se calculó el porcentaje de grasa (% G), utilizando el protocolo de Lohman (1992), según la clasificación propuesta por el IMC Cole et al (2000), y IAC a través de la clasificación propuesta por Bergman et al. (2011). Se utilizó la estadística de tendencia central. En cuanto a los valores medios de los resultados relativos de grasa corporal se clasificaron, sobre todo en los niños y las niñas, como moderadamente alta. En cuanto a índice de masa corporal, los puntajes promedio fueron clasificados principalmente como normal para ambos sexos. Finalmente, los valores medios de la IAC para los hombres, la mayoría se clasificaron como sobrepeso, mientras que para las hembras de todos los grupos de edad analizados fueron clasificados como normales. El estudio concluye que existe una diferencia entre las clasificaciones propuestas de grasa corporal relativa (% GC), el IMC y el IAC, demostrando que es esencial llevar a cabo estudios adicionales que pueden verificar la existencia de correlación entre las variables.

PALABRAS CLAVE: Índices de Adiposidad Corporal Obesidad; Escolares.

COMPORTAMENTO DE ÍNDICES DE OBESIDADE E DE ADIPOSIDADE CORPORAL EM ESCOLARES DE AMBOS OS SEXOS DO MUNICÍPIO DE ARAPIRACA-AL EM DIFERENTES FAIXAS ETÁRIAS.

RESUMO

O objetivo desse estudo foi verificar os indicadores de obesidade dos escolares na faixa etária de 9 a 14 anos de idade do município de Arapiraca/Alagoas. Esse estudo tem 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 às dobras cutâneas subescapular, tríceps braquial, estatura, massa corporal total, perímetro do quadril e posteriormente, calculados os percentuais de gordura (%G) através do protocolo de Lohman (1992), o IMC através da

classificação proposta por Cole et.al. (2000), e o IAC através da classificação proposta por Bergman et al. (2011). Utilizou-se a estatística de tendência central. Quanto aos valores médios de gordura corporal relativa os resultados foram classificados, em sua maioria, tanto nos meninos quanto nas meninas, como moderadamente alto. Em relação ao IMC, os resultados médios foram classificados, em sua maioria, como normal para ambos os sexos. Por fim, os valores médios do IAC para o sexo masculino, em sua maioria, foram classificados como sobrepeso, enquanto para o sexo feminino em todas as faixas etárias avaliadas foram classificados como normal. O estudo conclui que há diferença entre as classificações propostas da gordura corporal relativa (%G), do IMC e do IAC, evidenciando que é essencial a realização de novos estudos que busquem verificar a existência ou não de correlação entre as variáveis avaliadas.

PALAVRAS-CHAVES: Índices de obesidade; Adiposidade Corporal; Escolares.