23 - HEIGHT EVALUATION OF CHILDREN AND TEENS OF THE MUNICIPALITY OF ARAPIRACA - AL.

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INTRODUCTION

The growth is a process inherent in the human being from conception occurs until after the adult size and resulting morphological changes such as increasing the amount of cells (hyperplasia) the increase in cell size (hypertrophy) and increased amount of intercellular substance (by extension)1. This process varies among individuals, because some suffer changes faster than others in the same age from the same genus, and also between boys and girls, because approximately 10 years to the heights as between the genders are similar growth spurt occurring primarily in the girls and shortly after in the boys1.

Diniz et al.2 point out that the World Health Organization (WHO) emphasizes the importance of studies on the levels of physical growth of children and adolescents in underdeveloped or developing countries, allowing it to identify the pattern of growth that is influenced by genetic factors, social and environmental fact which contributes significantly to the creation of both programs, as well as strategies for the promotion of health and quality of life3.

According to WHO (1995)5 is an internationally accepted monitoring of physical growth through anthropometric measurements of height and weight, which are used for the elaboration of normative physical growth curves used as references in many countries. The growth curves developed by the World Health Organization in 2007 (WHO, 2007)6, are considered as the reference standard at the international level, since the sample that generated the curves consisted of individuals from developed and developing countries, ethnicities, diferente customs and inheritance4.

To Souza and Pires Neto3, is the school that an interaction occurs between Physical Education and school during childhood until the end of puberty. In a school setting, anthropometric assessments may be conducted in physical education classes in order to assess levels of students' health, because "[...] to the height for age index can evaluate longitudinal bone growth, the past nutritional history, ethnic and geographical variations and secular trends of school "7.

Despite the importance and the need to monitor the physical growth of children and adolescents in the school environment, there is a paucity of studies assessing the stature in the state of Alagoas, in particular, in the city of Arapiraca.

Based on the foregoing, the present study aims to assess the stature of children and adolescents of both sexes enrolled in municipal schools in Arapiraca - AL.

METHODOLOGY

It is a cross-sectional study, in which there is only one measurement for further analysis, characteristic of research that evaluates the current state of amostra8. The study was approved by the Ethics Committee in Research of Federal University of Alagoas 003360/2011-75 protocol number.

The sample consisted of 469 schoolchildren of both sexes, the age group 10 to 15 years, 211 male and 258 female randomly selected among students duly enrolled in 2009 in the municipal education Arapiraca - AL.

To measure the height was used Sanny stadiometer® compact portable model, graduated in cm, following the protocol proposed in Petroski9.

To evaluate the relationship of height for age of the sample were used as reference growth curves for height / age proposed by the World Health Organization (WHO, 2007)6.

For reliability and statistical significance to the results of the comparison, we applied the first verification test Komogorov-Smirnov normality. Next, in order to characterize the study sample was used for statistical central tendency (mean and standard deviation). Later, in order to contemplate the full possibilities of comparing heights between the ages by sex, we used the method of analysis of variance (ANOVA one way), and to verify the existence of gender differences by age, we used the t test Student for independent samples. Finally, to identify possible differences in the comparisons was used post hoc Tukey procedure. The level of significance was set at $\alpha \leq 0.05$, ie 95% probability of affirmatives and / or negative pointed out during the investigations.

RESULTS

The results presented in Table 1 show according to the Kolmogorov-Smirnov normality between the existence of the height values at different ages, both male students, and the female students.

Table 1 - Test of the Kolmogorov-Smirnov Normality for height between the ages of female students (F) and male (M) enrolled in municipal schools of Arapiraca in 2009.

	10 years	11 years	12 years	13 years	14 years	15 years
N	47	61	58	36	36	26
F	,555	,667	,905	,905	,754	,256
N	43	45	34	34	26	28
M	,824	,306	,289	,748	,936	,993

Table 2 presents the mean and standard deviation for the stature of female students (F) and male (M) enrolled in municipal schools of Arapiraca in 2009.

By taking into account the current growth curves for height for age proposed by the OMS6, both male students, and to female students, have values within the limits of normality offered internationally in all age brackets.

Table 2 - Mean values and standard deviation for the stature of female students (F) and male (M) enrolled in municipal schools of Arapiraca in 2009.

	10 years	11 years	12 years	13 years	14 years	15 years
N	47	61	58	36	36	26
F	1,32±0,05	1,42±0,08	1,48±0,08	1,51±0,08	1,57±0,06	1,57±0,06
N	43	45	34	34	26	28
M	1,34±0,07	1,39±0,06	1,46±0,09	1,48±0,08	1,56±0,07	1,62±0,07

Tables 3 and 4 show, respectively, the results of comparative analysis of stature between the ages of female students (F), and the results of comparative analysis of stature between the ages of male students (M) enrolled in municipal schools of Arapiraca in 2009.

Table 3 shows that the school have significant differences to 10 years for all ages, 11 years to the significant differences to 13 years occurs at age 14 and age 15 to 12 years is significant differences from 12 to 13 years to 14 years and 15 years, it occurs between 14 and 15 years.

Table 3 - Comparative analysis for height between the ages of female students enrolled in municipal schools of Arapiraca in 2009.

	10 years (n=47)	11 years (n=61)	12 years (n=58)	13 years (n=36)	14 years (n=36)	15 years (n=26)
10 years (n=47)	-	,000*	,000*	,000*	,000*	,000*
11 years (n=61)	,000*	-	,492	,000*	,000*	,000*
12 years (n=58)	,000*	,492	-	,027*	,000*	,000*
13 years (n=36)	,000*	,000*	,027*	-	,101	,059
14 years (n=36)	,000*	,000*	,000*	,101	-	,998
15 years (n=26)	,000*	,000*	,000*	,059	,998	-

* Significant difference to the significance level of $\alpha \leq 0,05$.

Table 4 shows that the students differ significantly between the ages of 10 to 12, 13, 14 and 15 years, this difference occurs between the age of 11 to 13, 14 and 15 years, significant differences also occur between the ages 12 to 14 and 15 years and to compare the ages of 13 to 14 and 15.

Table 4 - Comparative analysis for height between the ages of male students enrolled in municipal schools of Arapiraca in 2009.

	10 years (n=43)	11 years (n=45)	12 years (n=39)	13 years (n=34)	14 years (n=26)	15 years (n=28)
10 years (n=43)	-	,063	,000*	,000*	,000*	,000*
11 years (n=45)	,063	-	,001*	,001*	,000*	,000*
12 years (n=39)	,000*	,001*	-	1,00	,001*	,000*
13 years (n=34)	,000*	,001*	1,00	-	,001*	,000*
14 years (n=26)	,000*	,000*	,001*	,001*	-	,040
15 years (n=28)	,000*	,000*	,000*	,000*	,040	-

* Significant difference to the significance level of $\alpha \leq 0,05$.

Table 5 shows the values for the comparative analysis for stature between the sexes by age of students enrolled in municipal schools of Arapiraca in 2009.

The significant differences in height between sex of the students by age occur at ages 11, 13 and 15 years.

Table 5 - Comparative analysis for stature between the sexes by age of students enrolled in municipal schools of Arapiraca in 2009.

	Male		Female		
age (years)	n	Height	n	height	*T*
10	43	1,34±0,07	47	1,32±0,05	,804
11	45	1,39±0,06	61	1,42±0,08	,013*
12	39	1,46±0,09	58	1,48±0,08	,601
13	34	1,48±0,08	36	1,51±0,08	,049*
14	26	1,56±0,07	36	1,57±0,06	,735
15	28	1,62±0,07	26	1,57±0,06	,015*

* Significant difference to the significance level of $\alpha \leq 0,05$.

DISCUSSION

The mean values of height for age presented in this study indicate that under the current curves proposed by the school OMS6 the male and female are within the normal range in all age brackets corroborating studies10, 11, 17,18 performed at both the regional and studies that took place outside the context of social and cultural reality of the sample.

A comparative study with 2111 children and adolescents conducted in the Northeast, specifically in the states of Sergipe and Pernambuco, by Silva et al. al.10 found that children and adolescents are evaluated within a normal pattern of growth in relation to height growth curves used as reference of the National Health and Nutrition (PNSN) and the National Center for Health Statistics (NCHS).In another study of 1172 school children, 298 individuals included in the sample of a mixed longitudinal study of 874 members and a cross-sectional study conducted with female students and male in the College Application Federal University of Santa Catarina, who used the percentile curves of WHO (1995)5 concluded that the stature of the school increased with age in both genders and that 13 years from the male students had a significant increase in growth which corroborates with this estudo17.Other research results obtained corroborate the results of this study was performed through a longitudinal follow-up with 70 children of both sexes between the ages of 10 to 14 years, 35 boys and 35 girls, who analyzed the growth and peak height speed of growth, and concluded that even 12 years was not observed large difference between the sexes, which at 13 and 14 years boys had higher stature than girls, and the peak height velocity occurred in the same period, and to 13 years in boys and girls from 10 to 11 years18.

It is worth noting that growth in addition to being something inherent to human beings occurs is dependent on social factors as stated by Sobral (1988), where socioeconomic factors and family size correlates directly and significantly with the growth of an individual. Rock and Sun (2003) reported several factors that have influence on the growth such as: genetic influence and family, maternal behavior during pregnancy, during breastfeeding, hormonal influence, ethnic influence, nutrition and maturação19.

CONCLUSION

It is concluded that the height of male students and female evaluated are within normal limits in relation to the growth curves proposed by the WHO (2007)6 and that there are significant differences in height between the ages by sex and stature between the sexes by age groups.

It is worth mentioning that the results presented in this study corroborate statements and findings in current literature.

Finally, it is suggested that studies are performed with a longitudinal and more numerous samples to identify patterns in the search for references to the process of statural growth of children and adolescents living in the city of Arapiraca - AL.

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HEIGHT EVALUATION OF CHILDREN AND TEENS OF THE MUNICIPALITY OF ARAPIRACA - AL.
ABSTRACT

The objective of this study was to evaluate the stature of schoolchildren of both sexes with age between 10 and 15 years. The sample consisted of 469 schoolchildren of both sexes of 10 and 15 years, voluntarily chosen, being 211 males and 258 females enrolled in municipal schools in the city of Arapiraca - AL in 2009. To collect data we used a stadiometer and protocol cited by Petroski (2003). For the treatment of the data was used statistics of central tendency, and then seeks to include the total number of possibilities for comparison of stature between the ages by sex, we used the method of analysis of variance (ANOVA ONE WAY), and to verify the existence of gender differences by age, we used the Student t test for independent samples. Finally, to identify possible differences in the comparisons was used post hoc Tukey procedure. The level of significance was set at $\alpha \leq 0,05$. The results show that both the male students, and females are within normal limits in relation to the growth curves proposed by WHO (2007). It was also observed that there were significant differences in the comparative analysis for height between ages and between sexes by age. It is concluded that the results corroborate the statements and findings in the existing literature in relation to current growth spurt.

KEYWORDS: height, children, adolescents.

ÉVALUATION HAUTEUR DES ENFANTS ET ADOLESCENTS DE LA MUNICIPALITÉ DE ARAPIRACA - AL.
RÉSUMÉ

Le but de cette étude était d'évaluer la stature des écoliers des deux sexes avec l'âge entre 10 et 15 ans. L'échantillon se composait de 469 écoliers des deux sexes de 10 à 15 ans, volontairement choisi, étant 211 mâles et 258 femelles inscrites dans les écoles municipales de la ville de Arapiraca - AL en 2009. Pour collecter les données, nous avons utilisé une toise et du protocole cité par Petroski (2003). Pour le traitement des données a été utilisé des statistiques de la tendance centrale, et cherche alors à inclure un total de possibilités de comparaison de stature entre l'âge, par sexe, nous avons utilisé la méthode d'analyse de variance (Anova dans un sens), et de vérifier différences entre les sexes par l'âge, nous avons utilisé le test t de Student pour échantillons indépendants. Enfin, afin d'identifier d'éventuelles différences dans les comparaisons post-hoc a été utilisé Tukey procédure. Le niveau de signification a été fixé à $\alpha \leq 0,05$. Les résultats montrent que tant les étudiants de sexe masculin, et les femelles sont dans les limites normales en relation avec les courbes de croissance proposée par l'OMS (2007). On a également observé qu'il y avait des différences significatives dans l'analyse comparative de la hauteur entre les âges et entre les sexes par l'âge. Il est conclu que les résultats corroborent les déclarations et les conclusions de la littérature existante en matière d'accélération de la croissance actuelle.

MOTS-CLÉS: stature, les enfants, les adolescents.

EVALUACIÓN DE LA ALTURA DE LOS NIÑOS Y ADOLESCENTES DEL MUNICÍPIO ARAPIRACA – AL.
SUMARIO

El objetivo de este estudio fue evaluar la estatura de los escolares de ambos sexos con edades comprendidas entre los 10 y 15 años. La muestra consistió en 469 escolares de ambos sexos de 10 y 15 años, elegido voluntariamente, siendo 211 hombres y mujeres 258 matriculados en las escuelas municipales en la ciudad de Arapiraca - Alagoas en 2009. Para recopilar los datos se utilizó un estadiómetro y el protocolo citado por Petroski (2003). Para el tratamiento de los datos se utilizó la estadística de tendencia central, y luego trata de incluir el número total de posibilidades para la comparación de la estatura de entre las edades, por sexo, se utilizó el método de análisis de varianza (ANOVA de una vía), y comprobar que las diferencias entre los sexos por edad se utilizó la prueba t de Student para muestras independientes. Por último, para identificar las posibles diferencias en las comparaciones se utilizó el procedimiento post hoc de Tukey. El nivel de significación se fijó en $\alpha \leq 0,05$. Los resultados muestran que tanto los estudiantes varones y mujeres se encuentran dentro de los límites normales en relación con las curvas de crecimiento propuesto por la OMS (2007). También se observó que existían diferencias significativas en el análisis comparativo de altura entre las edades y entre los sexos con la edad. Se concluye que los resultados corroboran las declaraciones y los hallazgos en la literatura existente sobre el crecimiento en estatura.

PALABRAS CLAVE: altura, niños, adolescentes.

AVALIAÇÃO ESTATURAL DE CRIANÇAS E ADOLESCENTES DO MUNICÍPIO DE ARAPIRACA – AL.
RESUMO

O objetivo do presente estudo foi avaliar a estatura de escolares de ambos os sexos com a idade entre 10 e 15 anos. A amostra foi constituída de 469 escolares de ambos os sexos de 10 e 15 anos, escolhidos voluntariamente, sendo 211 do sexo masculino e 258 do sexo feminino matriculados na rede municipal de ensino do município de Arapiraca – AL no ano de 2009. Para coleta dos dados utilizou-se um estadiômetro e o protocolo citado por Petroski (2003). Para o tratamento dos dados foi utilizado a estatística de tendência central, e posteriormente, visando contemplar o total de possibilidades de comparação das estaturas entre as idades por sexo utilizou-se o método de análise de variância (ANOVA ONE WAY), e para verificar a existência de diferenças entre os sexos por idade utilizou-se o Teste t de student para amostras independentes. Por fim, para identificar as possíveis diferenças das comparações foi utilizado o procedimento Post Hoc de Tukey. O nível de significância adotado foi de $\alpha \leq 0,05$. Os resultados demonstram que tanto os escolares do sexo masculino, quanto do sexo feminino se encontram dentro do padrão de normalidade em relação às curvas de crescimento proposta pela OMS (2007). Observou-se também que houve diferenças significativas nas análises comparativas para a estatura entre as idades e entre os sexos por idade. Conclui-se que os resultados corroboram com as afirmações e achados existentes na literatura científica vigente em relação ao crescimento estatural.

PALAVRAS-CHAVES: estatura; crianças; adolescentes.