214 - PHYSICAL GROWTH PROFILE OF STUDENTS FROM PRIVATE SCHOOLS IN ARAGUAÍNA-TO

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INTRODUCTION

Seeking to understand the behavior of the parameters of physical growth in schoolchildren has been the subject of numerous studies, once cultural diversity, climate variability in various regions of the world, as well as genetic and socioeconomic differences appear to exert their influence over this variable .

Thus, modifications in physical growth may be due to genetic and environmental factors, or even the interaction of those two factors (Guedes and Guedes, 1997). In this sense, environmental conditions related to nutrition, diseases, socioeconomic status, urbanization, physical activity, psychological stress, in addition to season and climate, are among the most important environmental influences on physical growth (EVELETH , 1986). Several national and international studies have shown the relationship between the environmental aspects and the levels of physical growth (ROMANI AND LIRA, 2004; VALERIO et.al, 2006; NASIRIAN, H., TARVIJ-ESLAMI S.2006).

The study about the levels of growth on children and adolescents has been stimulated by the World Health Organization (WHO) in underdeveloped countries in development (WHO, 1995), considering that the growth patterns are one of the most used instruments to support child health, both in clinical area and in public health (TABLE et.al, 2006). Thus, monitoring the physical growth serves as a valuable means of information for the analysis of health of a population, especially in developing countries (MALINA, BOUCHARD & BAR-OR, 2004).

The use of some anthropometric indicators such as body mass, height and BMI, are the means most often used to monitor the conditions of physical growth of a population (RONQUI, 2003). Thus, the variables weight / age, height / age and weight / height have been constantly used as indicators of physical growth, especially during school years when the variations of growth in children become more evident with increasing age. So many studies have been taken over the years in order to study the growth of the child in school years. (MACHADO AND KREBS 2001; PETROSKI et.al, 2008; ORDENet.al,2009).

In Brazil there are few studies related to growth, such studies are mostly regionalized covering the unique characteristic of the local population as well as climate and socio-economic conditions (PIRES AND LOPES 2004; FAGUNDES AND KREBS 2005; DINIZ et.al, 2008). However, the diversity of races and ethnic groups stemming from Brazil´s colonization , as well as the fact that each region presents climate and social-cultural habits differentiated, factors that influence growth, it is important to develop regional studies in different age groups to search profiling in different age groups. So, the study of population growth curve, having on it, the influence of regional and genetic aspects of each community, influence directly on final height of a population (SILVA, et.al, 2005).

The use of growth curves by several researchers has been used for the analysis of growth variables in different groups and different populations by sampling selected carefully (WALTRICK and Duarte, 2000; ROMAN, 2004; TABLE et.al, 2006; MARRAMARCO, 2007). Those curves are used in several national studies having as proposed by the literature the indicator presented by the National Center of Health Statistics (NCHS). But several scholars in the field have recommended caution in using this reference, for those parameters are restricted and do not cover the ethnic and environmental conditions of each region (Silva et.al, 2005; PRADO, 2005, Diniz, 2006;). This way, these scholars defend the creation and use of local parameters that take into account those peculiarities.

Thus, it is important to do researches both in order to get local data that will evaluate the current level of growth of schoolchildren, as well as serve as a database for further researches in the area.

METHODOLOGICAL PROCEDURES

Study Design

The present study is characterized as a descriptive and exploratory research and qualitative and quantitative, aiming to get to know the physical growth profile of students in private schools in Araguaina-TO.

Population and Sample

The sample was obtained from the information provided by the regional education departmentl in the city, where 14 was the number of schools throughout the region, who had children duly registered and aging 7 to 10 years, a total of 1643 children . Of this total 20% constituted the study sample, representing a total of 329 students with 173 boys and 156 girls who were evaluated in 6 schools. The selection of schools was for convenience, in order of authorization for the research by the directors. The constitution of the sample was intentional, covering the number of students required to reach the percentage of the desired sample for this study.

Instruments and Procedures

Before data collection, there was a previous contact with the directors explaining the study objectives and procedures to be performed. Parents or guardians consented to the participation of children by signing the consent form. The intervention protocols in the study were approved by the Committee Research Ethics of the Tropical Medicine Foundation of Tocantins (FMTT) under number 183/2008.

For measurement of body mass we used a digital scale labeled G-TECH, FW METER model, with a digital platform and checking the maximum weight of 150Kg, with measurements from 0 to 150Kg, and the evaluated ones were barefoot and wearing the least clothing possible. Height was measured using a tape measure, scaled in centimeters, and fixed 50 cm above the ground, where the individual was barefoot positioning his back to the tape and the head positioned in the Frankfurt plane. The square was slidden to the top of the head and it was taken the closest reading that was added to the distance that the tape was above the insertion of the wall with the soil in mark (0) to obtain the final height.

For evaluating the physical growth, the children were classified according to the adequacy height / age: weight / age comparing to the benchmarks of growth curves of the "NCHS" (2002) (National Center for Health and Statistics), recommended by World Health Organization (WHO). The percentile distribution of weight and height, allowing the evaluation between the observed and the expected percentile, was performed in the following ranges: 3,3 ├10, 10 ├20, 20 ├50, 50 ├80, 80 ├90, 90 ├97; 97

being that the expected number of subjects, considering a group of 100 people, would be respectively 3, 7, 10, 30, 30, 10, 7, 3.

Statistical Analysis

Percentiles were used for descriptive analysis of physical growth variables of the values of this study with the values of (NCHS, 2002).

RESULTS AND DISCUSSION

The results found in the distribution of body mass percentile for age, in the analyzed population, revealed, by Table 1, that 48% had a percentage below the (P50) and 52% were above the (P50), which shows a tendency of the investigated students to higher weights. It is also evident in Table 1, that the highest concentration of the sample was located between the percentiles P20 and P80 having the observed frequencies and percentages presented very close values when compared to those of the NCHS reference pattern reflecting a profile of normality. It is worth noting that the proportion of students who were below (P <03) was relatively low (0.60%) showing a low proportion of children with malnutrition. In the (P $\geq$ 97) was found twice as many students than expected (5.48%) indicating a certain proportion of students with obesity. In the students aged 7 to 10 years in Londrina-PR, of high socioeconomic status, we found low rates of students with low weight index or risk of malnutrition, but a high percentile of children at risk of overweight (Ronquido, 2003) . Those results were similar to those found in the city of Farropilha-RS (MARRAMARCO, 2007).

Table 1. Sample distribution in percentile weight / age according to the NCHS references.

Percentile	Expected		Observed	
Body Mass	N	%	N	%
<3	9,87	3	2	0,6
03 |--- 10	23,03	7	23	6,99
10 |--- 20	32,9	10	32	9,73
20 |--- 50	98,7	30	101	30,69
50 |--- 80	98,7	30	97	29,49
80 |--- 90	32,9	10	35	10,64
90 |--- 97	23,03	7	21	6,38
=97	9,87	3	18	5,48
Total	329	100%	329	100%

It was observed in the surveyed students that they have low rates of malnutrition and low weight index, but the rate of obesity was higher than expected. According to Cano et.al (2005) the eating habits are conditioned early in children by their parents, and as currently there is a tendency for fatty foods or high-calorie fast food, those children may develop obesity early in life. In this context, it is reinforced the need for nutritional guidance by the educational entity to the students and tutors avoiding the increase of overweight and obesity preventing future health problems. Figure 1 shows the behavior of the distribution percentile of body mass of the evaluated sample with the values of the NCHS.

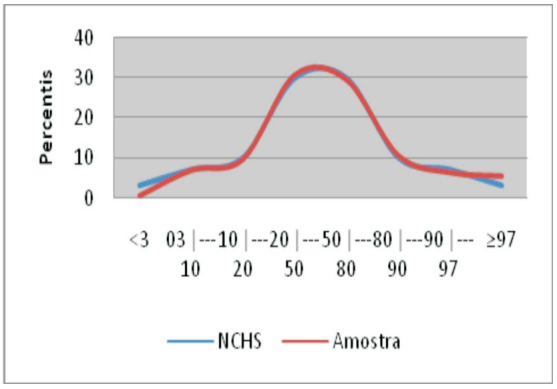

Figure 1. . Curve of the percentage values in the percentil distribution of weight / age of the surveyed sample in relation to reference (NCHS).

In the results of height for age, it comes across the table 2 that 45% of the surveyed schoolchildren had percentages below (P50) and 55% were above the (P50), which shows a tendency of the sample to high heights. There is a high frequency percentage of students between the percentiles P20 and P80 showing a similarity between the sample and reference adopted. It was also observed that the proportion of students who were in P <03 (0.30%) and 03 | --- 10 (4.86%) were low, showing low proportion of children with dwarfism or short stature . In the upper end of the curve values were higher than expected between the 90 percentile | --- 97 (8.51%) and $\geq$ 97 percentile (6.08%), and $\geq$ 97 percentile was found twice as many children than expected, showing children of higher heights.

Table 3. Distribution of the sample height percentile for age according to the NCHS references.

Percentile	Expected		Observed	
Height	N	%	N	%
<3	9,87	3	1	0,3
03 |--- 10	23,03	7	16	4,86
10 |--- 20	32,9	10	36	10,94
20 |--- 50	98,7	30	95	28,88
50 |--- 80	98,7	30	91	27,66
80 |--- 90	32,9	10	42	12,77
90 |--- 97	23,03	7	28	8,51
=97	9,87	3	20	6,08
Total	329	100%	329	100%

Results similar to those found in this study were found in schoolchildren in southern Brazil (Fagundes and Krebs, 2005, Marramarco, 2007). The studies by Waltrick and Duarte (2000) found a higher proportion of students in the appropriate range of height. Larger differences in height can be linked to socioeconomic conditions, unfavorable sanitation and urbanization (MARRAMARCO, 2007). Figure 2 shows the behavior of the distribution curve in the height percentile in the sample with the values of the NCHS.

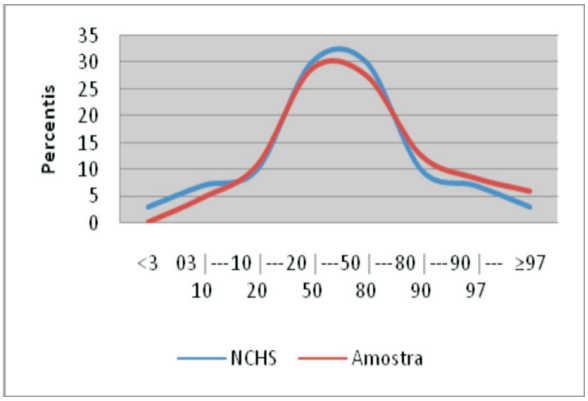

Figure 2. Curve of the percentage values in the percentil distribution of height / age of the surveyed sample in relation to reference (NCHS).

CONCLUSIONS

Based on the evidences it appears that most of the studied samples were within the desired percentiles, presenting a normal profile, showing an increase tendency in height and weights. However, it emphasizes the need for preventive nutrition guidelines by the educational institution, the children, parents or guardians, in search of nutrition education, with the desire to reduce and/or prevent the increasing risks of overweight in the schools; therefore, preventing future risks resulting from bad eating habits.

Regarding the use of information from other countries for the classification of physical growth in populations, which are not from the same origin as of this study, it is advisable to be careful because the genetic and environmental, as well as eating habits predominant in each region will determine the greatest or minor changes in physical growth and in body mass.

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PHYSICAL GROWTH PROFILE OF STUDENTS FROM PRIVATE SCHOOLS IN ARAGUAÍNA-TO.

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ABSTRACT

The evaluation of the body structure modifications related to physical growth, such as body structure and body mass, represent a major means of obtaining information of a population´s health condition. In this sense, the current research sought to answer the following question: What´s the physical growth profile of 7 – 10 year-old private school students in the city of Araguaína-TO? There were 329 children participating in this research, of which 173 were boys and 156 were girls. The growth was evaluated in both genders as the body mass and structure. The adequacy structure / age, weight / age was considered according to the reference values proposed by the National Center for Health Statistics (NCHS-2002) and related them to the values of the one studied. For data analysis we used percentiles. The results revealed a normal profile in most of the students surveyed, showing a tendency for high weight and height. It emphasized the importance of measures of nutritional guidelines in schools designed to reduce and prevent cases of excess weight among school children to avoid future problems of health risk at older ages.

KEYWORDS: Physical growth, body mass, height.

PROFIL DE LA PHYSIQUE DE LA CROISSANCE DE L'ÉCOLE DE RESEAU DE L'ENSEIGNEMENT PRIVÉ ARAGUAINA-TO.

RÉSUMÉ

L'évaluation des modifications des structures corporelles liées à la croissance physique, comme l'hauteur et la masse corporelle, representent un moyen important pour obtenir des informations des conditions de santé d'une population. Dans ce sens l'étude ci présente a focalisé répondre la question suivante: Quel est le profil de croissance physique des étudiants de 7 à 10 ans de l'enseignement privé, dans la ville de Araguaína - TO? 329 Enfants, dont 173 garçons et 156 filles ont participé de cette enquête. La croissance fût cotée dans l'enssemble des genres quant à la masse corporelle, et la hauteur. On a considéré hauteur/âge, poids/âge en prenant comme référence les valeurs proposées par National Center of Health Statistics (NCHS-2002) en les reliant avec les valeurs da l'atmosphère étudiée. Pour l'analise des données, le poucent a été utilisé. Les résultats trouvés ont rélévé um profil normal dans la majorité des étudiants qui ont été investigués, relatant des tendences de poids et de hauteur élévées. En conclusion l'importance des mesures d'orientation nutritionelles des écoles avec l'objectif de réduire et de prévenir les cas d'excès de poids entre les élèves em evitant des problemes de santé dans le future.

MOTS-CLÉS: Croissance physique, masse corporelle, hauteur.

PERFIL DEL CRECIMIENTO FÍSICO DE LOS ESCOLARES DE LA RED PRIVADA DE ENSEÑANZA DE ARAGUAÍNA-TO.

RESUMEN

La evaluación de las modificaciones de las estructuras corporales relacionadas al crecimiento físico, como estatura y masa corporal, representan un importante medio de obtención de informaciones de las condiciones de salud de una población. En este sentido el presente estudio ha objetivado contestar a la siguiente cuestión: ¿cuál el perfil de crecimiento físico de los escolares de 7 a 10 años de la red privada de enseñanza, en la ciudad de Araguaína-TO? Participaron de esta investigación 329 niños, siendo 173 chicos y 156 chicas. El crecimiento fue evaluado en ambos los géneros en cuanto a la masa corporal, estatura. Se consideró la adecuación estatura/edad, peso/edad usando como referencia los valores propuestos por National Center of Health Statistics (NCHS-2002) relacionándolos con valores de la muestra investigada. Para el análisis de los datos se utilizó percentiles. Los resultados encontrados revelaron un perfil de normalidad en la mayoría de los escolares investigados, presentando tendencias para pesos y estatura elevadas. Se concluye enfatizando la importancia de medidas de orientación nutricional en las escuelas con objetivo de reducir y prevenir casos de exceso de peso entre los escolares evitando futuros problemas de riesgo a la salud en edad mayores.

PALABRAS CLAVES: Crecimiento físico, masa corporal, estatura.

PERFIL DO CRESCIMENTO FÍSICO DOS ESCOLARES DA REDE PARTICULAR DE ENSINO DE ARAGUAÍNA-TO.

RESUMO

A avaliação das modificações das estruturas corporais relacionadas ao crescimento físico, como estatura e massa corporal, representam um importante meio de obtenção de informações das condições de saúde de uma população. Neste sentido o presente estudo objetivou responder o seguinte questionamento: Qual o perfil de crescimento físico dos escolares de 7 a 10 anos da rede particular de ensino, na cidade de Araguaína –TO? Participaram desta investigação 329 crianças, sendo 173 meninos e 156 meninas. O crescimento foi avaliado em ambos os gêneros quanto ao massa corporal, estatura. Considerou-se a adequação estatura/idade, peso/idade tomando-se como referência os valores proposto pelo National Center of Health Statistics (NCHS-2002) relacionando estes com os valores da amostra investigada. Para análise dos dados utilizou-se percentis. Os resultados encontrados revelaram um perfil de normalidade na maioria dos escolares investigados, apresentando estes tendências para pesos e estatura elevadas. Conclui-se enfatizando a importância de medidas de orientação nutricional nas escolas com objetivo de reduzir e prevenir casos de excesso de pesos entre os escolares evitando futuros problemas de risco à saúde em idades maiores.

PALAVRAS-CHAVES: Crescimento físico, massa corporal, estatura.

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