23 - INDICES ANTHROPOMETRIC, SKIN FOLDS AND RELATED TO CHRONIC METABOLIC DISORDERS IN STUDENTS OF 11 TO 16 YEARS OF THE NETWORK STATE AREA NORTH OF TERESINA-PI

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INTRODUCTION

All changes in the culture of a population imply consequences on the demographic profile of the same. Long malnutrition was the main problem inherent to feeding the world tried to eradicate in different parts of the planet. Information from UNICEF (1998) estimated that in developing countries, about 55% of infant deaths were linked to malnutrition, not existing in the recent history of mankind, any morbid situation of this magnitude. Today, a dyad is lived, since prolonged and prolonged imbalance between caloric intake and energy expenditure has fostered the emergence of a reverse of that trying to eradicate (malnutrition) obese population. The World Health Organization (WHO) estimated that in 2005, 1.6 billion adults was overweight and 400 million were obese; in 2015 the number is expected to reach 2.3 billion and 700 million, respectively.

The increase in the percentage of fat in adolescents is a fact that has been spreading alarmingly rising statistics of a disease that falls under an international designation of a global epidemic of the XXI century: obesity. This is a chronic disease that grows in epidemics worldwide, affecting all age groups. Has a multifactorial etiology and is associated with genetic, environmental and behavioral factors, and concern because of its impact in the short and long term (Flegal KM, Carroll MID; CL JOHNSON, 2000), also leading to a host of other metabolic disorders. Considering that the genetic heritage of the human species may not have been important changes in the span of a few decades, certainly environmental factors exert a huge influence on this epidemic.

Overweight and obesity have entered the ranks of public health problems, becoming far more frequent than child malnutrition itself, signaling an epidemiological transition process that must be properly valued in terms of public health, since it finds associated with a high morbidity rate (ratio between the number of cases of illness and the number of inhabitants in a given place and time, or the relationship between healthy and diseased) and mortality (number of deaths). The increase in the rate of body fat of the population still provoke economic, medical, social and psychological serious and lifelong child and adolescent consequences.

The state of health in childhood, may be reflected by changes in body composition. As the state of malnutrition and overweight characteristic of the nutrition transition, child health can be an indicator of the health of a country and be a predictor of living conditions of a particular region. Nutritional disorders of childhood may be related to the development of chronic diseases in adulthood, which is the biggest challenge for health systems in recent years (PEREIRA; Lanzillotti; Soares, 2010; SILVA; COTTA; ROSE, 2013) .

Faced with arguments, the rationale for this research is linked to disregard found within schools such an important function of the physical educator: a physical assessment. The lack of it corroborates the growing profile of adolescents who have had anthropometric characteristics of the data set by the World Health Organization (WHO).

A school is an institution that represents a unit educator and familiarity with the right to elect correct behavior patterns of lifestyle should be separated within the same affecting mainly the whole family of children and adolescents, who often represent a major obstacle in this process awareness, lack of information or even the convenience of already having some kind of chronic disease so you need not avoid them.

Explained by other reasons there is a need to make the evaluation of anthropometric indices related to health in a goal to be worked into the Physical Education due to their degree of importance and in order to evaluate, interpret, correlate, understand, organize, and apply the sort results (FENANDES, 1999). The purpose of this would guide the teacher along with PCN's, preparing their lessons geared to the problems and needs found in their student body.

Diagnose, educate and motivate your students to incorporate regular exercise as part of their lifestyles is part of a challenging role. For years scientists exercise, other health professionals and physical fitness state that regular physical activity constitutes the best defense against developing chronic diseases, however physical inactivity continues leading to higher rates of these diseases (HEYWARD, 2004) . Healthy habits need to be adopted in childhood and adolescence to begin the process of prevention, since at this stage there is an increase both in size and in the number of fat cells. In this period, so that adolescents should be evaluated and submitted to balanced meals, encouraging them tophysical activity and changes in eating habits and the whole family. The control of obesity during childhood and adolescence begins at home and there is a continuity of this process within the school, through the evaluation of anthropometric indices.

That said, the aim of this study was to trace through the measurement of anthropometric indices a profile of students from 6th to 8th grade of elementary school (5th to 7th corresponding series), aged between 11 and 16 years, students from a school state located in the northern area of Teresina-Pi, in Porenquanto neighborhood, correlating anthropometric indices checked the possible incidence of chronic diseases associated with metabolic disorders. Since the early identification of patients with metabolic disorders enables more effective intervention in the treatment of the same.

METHODOLOGY

This study was conducted with a sample of 300 students from a universe comprised of 800 students from 6th to 8th grade of primary school (equivalent to 5th grade 7 will the old rules of LDB) from a school of public schools in Teresina-Pi . Students have between 11 and 16 years, of both sexes, with 90 being male (30%) and 210 females (70%). The age range of this sample was advocated because once triggered metabolic disorders that age, early detection represents a solution to these children and adolescents are not adults vulnerable to chronic diseases in the future by adopting styles of lives guided by exercise and balanced diet and other healthy habits.

Anthropometry is the science that studies and evaluates the measures of size, weight and body proportions of the human body. It consists of quick and easy performance measures, it does not require sophisticated equipment with high financial cost. Anthropometry presents valuable information with regard to the prediction and estimation of the various body components sedentary or athletes, growth, development and aging (Fernandes, 1999).

Evaluation using anthropometric indices is a key component for a profile of health and also physical fitness of the individual. By percentage of fat, for example, can estimate healthy body weight and formulate dietary recommendations and exercise prescriptions, and monitor the growth of children and adolescents and identify those at risk for fat below or above recommended.

Anthropometry was used to obtain data for this study is considered the most useful method to track obesity, inexpensive, noninvasive, universally applicable, and the simplicity of its implementation has a positive balance of popular acceptance. To get the anthropometric indices, some combinations of two or more basic anthropometric information is performed, for example, weight, sex, age and height.

There are several ways to classify and diagnose obesity. One of the most used worldwide is based on the severity of overweight, which is done by calculating the Body Mass Index (BMI) or Quetelet index, which is recognized as the international standard to assess the degree of obesity through the following formula:

$$BMI = Weight / (Height^2)$$

The use of BMI to identify overweight and obese adults is consensus among scholars in the field, and its use in nutritional assessment of children and adolescents began to be more widespread, currently being considered by the WHO as a reference for identifying overweight and obesity.

The higher the BMI, the greater the chances of premature death and of developing chronic comorbidities related to overweight and obesity, diabetes mellitus, hypertension and other cardiovascular diseases.

BMI was applied to 300 students sample components and classified according to the international standard BMI chart. The height and weight were measured at Filizola scale, mark credibility in the market.

Another index Skin folds were measured (DC) subscapular and triceps in order to obtain more detailed data on the quality of the students' body weight data.

The measurement of skinfolds as a simple, inexpensive and easy to use technique, mainly due to high reliability and correlated optimally with more sophisticated techniques. The values of skinfolds are used for the diagnosis and the evaluation of a possible obesity, but also to be possible to establish a continuity of evolution, since when thins there is a reduction in values. These values are found using specific instruments denominated Caliper Skin Folds (Fernandes, 1999).

The skinfold measurements shouldnt be Performed s always on the right side evaluated. The subcutaneous tissue should be differentiated from muscle tissue using the thumb and forefinger of his left hand. The compass should be placed so that it is perpendicular to the ends of the crease and beat 1cm distally down the exact point. For the pressure exerted by the folds of the bar can produce its full effect, one must wait two seconds to read be performed. The subscapular skinfold (SB) is obtained obliquely to the longitudinal axis following the direction of the ribs being located 2 cm below the inferior angle of the scapula. The triceps skin fold (TR) is obtained along the longitudinal axis of the arm, the back side, and its exact repair point the average distance between the superior lateral edge of the acromion and the olecranon. (Fernandes Filho, 1999).

There were three successive measurements at the same location, considered as the intermediate measured value adopted for the purpose of calculations. When occur more than 5% between a measure and the remaining discrepancy in the same place, a further determination is made.

This study protocol Guedes for children and adolescents (7-18 years) and the compass was used Cescorf, which despite being plastic, it is used and accepted for data collection of scientific research and the accuracy of it was used will be maximized according to the correct use (by the assessor) of standard measurement protocols. The equations used for calculating the folds proposed by Guedes were as follows:

White Boys
S = sum of triceps and subscapular DC
7A→12 years F% = 1.21 x (S) - 0.008 x (S^2) -1.7
12 to 14 years →G% x = 1:21 (S) - 0.008 x (S^2) - 3.4
14 to 17 years →G% x = 1:21 (S) - 0.008 x (S^2) - 5.5
Glack guys
7A→12 years F% = 1.21 x (S) - 0.008 x (S^2) -3,5
12 to 14 years →G% x = 1:21 (S) - 0.008 x (S^2) - 5.2
14 to 17 years →G% x = 1:21 (S) - 0.008 x (S^2) - 6.8
Girls of any maturational level
% 1:33 G = x (S) - 0.013 x (S^2) - 2.5
Sum of DC> 35mm
Boys:% G = 0.783 x (S) + 1.6
Girls:% G = 0.546 x (S) + 9.7

In addition, an interview was completed in an attempt to gather as much information as possible to detect any metabolic disorder or predisposition to develop them. The first question refers to the incidence of chronic disease in the family and the second refers to weekly frequency that students practice physical activity.

Results and Discussion

Composing the students' study, 80 are classified "under-weight" according to the international BMI table, which corresponds to 26.7% of the sample had 120 students "normal" weight, constituting 40% of the sample, seven were found in the "overweight" area corresponding to 23.3% of the sample. And finally, 30 were "Obesity Grade I", the equivalent of 10% of the sample surveyed.

Table 1. International Classification of BMI values

Category	BMI	
Underweight Bellow	Bellow 18,5	Healthy weight equals the normal weight.
Normal Weight	18,5 - 24,9	
Overweight	25,0 - 29,9	
Grade I Obesity	30,0 - 34,9	
Grade II Obesity	35,0 - 39,9	
Grade III Obesity	40,0 and abover	

Only 40% of the sample were related to "Normal weight" patterns, indicating a BMI between 18.5 and 24.9, while 33.33% is framed in BMI between 25 and 34.9, featuring a profile of "overweight "and" Grade I obesity. "

In such a small sample can be seen that the results corroborate the expectations of other studies, according to Bouchard (2003), data from virtually every country in the industrialized world, and even in developing countries, show a ratio growing adolescents and adults overweight or obese actually. All indications and characteristics of the culture of Western life suggest that the problem will become worse in coming decades. Bouchard (2003) also makes reference to a study conducted in the United States, through which it was found that people who were in the highest BMI ranges, ie, the severely obese are heavier than they were in the past. This suggests that there is not only the increase in the number of obese people worldwide are also increasing proportions of obesity. Obese of the last century had a lower BMI than the current and the next they arise.

The presence of high BMI means vulnerability to the development of metabolic disorders studied here and their possible stabilization in adulthood if none of preventive measures in the habits of life of adolescents with this profile now.

In the case of the 26% who had BMI "underweight", suggests that the demographics are really going through a transition, because before malnutrition was the main problem faced by many countries when analyzed up weight and height children and adolescents, and although smaller than the index of "overweight" and "obesity" found together in the sample, but is still a high value indicating that many children show a lack of essential nutrients for its development is due to financial conditions or even the lack of proper intake of these nutrients. However, this research lacks sufficient to confirm any assumptions because of the focus has not been directed to this objective data. As for the 40% who had a BMI "normal weight" 120 pupils corresponding to the sample, although lower than the sum of that found above and below the weight (60%), is greater than two indices separately, which may indicate that there is chance of these problems are eradicated within the sample if some administrative measures are implemented (subject will be covered later in the final considerations).

Regarding skin folds, as there is a relationship between subcutaneous fat and total body fat, the sum of several DC can estimate the total body fat. Research set the thickness at multiple sites DC measures a common factor of body fat. It is assumed that approximately one third of the total fat is located subcutaneously in both men and women. There are well over 100 specific equations for the population to estimate the DC from various combinations of DC, bone diameters and circumferences. These equations were developed for relatively homogeneous populations and are supposedly valid only for individuals with similar characteristics such as age, sex, ethnicity, or level of physical activity, in order to further minimize the possible error margins considered in any prediction (HEYWARD, 2004). The equations proposed in the protocol GUEDES used to evaluate this sample, the results were fat percentage obtained classified taking into account the international table fat percentage in children and adolescents according to sex.

Table 2 - Classification of the percentage of fat in children and adolescents

Classificação	Masculino	Feminino
E. Baixa	Até 6%	Até 12%
Baixa	6,01 a 10%	12,01 a 15%
Adequada	10,01 a 20%	15,01 a 25%
M. Alta	20,01 a 25 %	25,01 a 30%
Alta	25,01 a 31%	30,01 a 36%
E. Alta	Maior que 31,01%	Maior que 36, 01 %

Source: Bristish Journal of Nutrition, vol. 63, no. 2, 1990 E = excessively; M = Moderately

For males, the results obtained were the following: only 22% of the sample (two pupils), the percent optimal fat and 78% (seven students) did not have a suitable compatible with the standard average percentage, which can be observed in the classification ""top of the table. Of these 78%, 22% (two students) were classified with a "moderately high" percentage; 34% (three students) had "high" percentage and two students, namely 22%, fat "too high".

Relating the results of DC with BMI, 30% of the sample consisted of males, 78% are within the frame that goes from "moderately high" fat "excessively high" which equates to "overweight" and "obesity" ie, both forms of detection anthropometric profile of these adolescents found discordant than normal values: most teens are above ideal for sex and age weight. For females, the results were: 23.9% of the female sample showed classification between "moderately high" and "too high", while 71.4% had a value of body fat within the proper range.

With respect to history, the 300 students surveyed, 180 of them, ie, (60%) said they had people who showed any chronic illness in the family being the most frequent Hypertension, Obesity and Diabetes. (was established during the research that would be valid only close relatives like parents, brothers and uncles consanguineous). 50 students, or 16.7% of the sample in said family for more than one type of chronic disease. Obesity increases the prevalence of the association of multiple risk factors, which can trigger from there a series of metabolic disorders. And yet it was found that only 120 students (40% of the sample) said they did not present cases of chronic illness in the family.

A discouraging fact, obtained with this study is that many people do not engage in physical activity during leisure time, or even inside the school. Thus, we ascertain that the components of the sample 300 students, only 80 students, about 26.7% of the sample, performs physical activity at least once during the week.

We realize also that of 100 (43.3% of the sample) who were overweight according to BMI classification, equivalent to 73.3% of subjects who did not practice any physical activity. Found that only 10 individuals with evidence of overweight engage in physical activity weekly.

CONCLUSION

With physical assessment, ie, the measurement of DC and BMI measurements, it was possible to trace an anthropometric profile of these students and can relate this profile with the incidence of chronic disease in the family and with physical inactivity. This relationship may have been evidenced in the results, as the vast majority of adolescents who were overweight and obese, reported at least one chronic illness in the family and did not exercise even once a week.

The two components of the evaluation indices (BMI and DC) who traced the anthropometric profile of the students were successful, according to the proposed order, with values very close to each other, validating results of the discrepancy of weight in relation to height / age in the sample, compared including the reality that the world is living the alarming rates of obesity,

increasing in this age group.

Therefore, the results obtained indicate that the number of students overweight and obesity represents a very large portion of the total percentage of the sample, refer to a distorted profile, non-standard and requires attention to physical educators progressive continuity of this work enabling a significant reduction in these indices.

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ABSTRACT

The increase in the percentage of fat in adolescents is a fact that has been spreading alarmingly rising statistics of a disease that falls under an international designation of a global epidemic of the XXI century: obesity, which is associated with a number of co- morbidities. Obesity in childhood and adolescence has become a global problem and it is known that a sedentary lifestyle, coupled with inappropriate eating habits are the main reasons for its early manifestation. To identify possible weight problems should be done with the individual a child, since the prevention and / or treatment can reduce the spread of this disease. Thus, an important role of the Physical Educator is to act preventively through the physical evaluation of anthropometric indices in schools. The objective of this research was to trace the anthropometric profile of students from 6th to 8th grade of elementary school (5th correspondent will 7th grade), aged between 11 and 16 years, of both sexes, students at a state school in the area North Teresina-Pi, in Porenquanto neighborhood. The study was conducted with 300 adolescents of this institution for 30 days between the months of September and October, during the morning shift, in which a physical evaluation was performed for measurement of body mass index - BMI and skinfolds - DC. In addition, an interview was also completed, with the consent of parents and the school board, in order to investigate the possible incidence of chronic diseases within the family and examine the frequency of weekly physical activity among students. The results showed that there is a significantly high rate of overweight / obesity by analyzing both BMI and DC, which showed a ratio of 61.1% for chronic diseases and family 43.3% for inactive adolescents.

KEYWORDS: Obesity, Prevention, Anthropometric Indices.

ÍNDICES ANTROPOMÉTRICOS , DOBRAS CUTÂNEAS E DOENÇAS CRÔNICAS RELACIONADAS AOS DISTÚRBIOS METABÓLICOS EM ALUNOS DE 11 A 16 ANOS DA REDE ESTADUAL DA ZONA NORTE DE TERESINA-PI

RESUMO

O aumento do percentual de gordura em adolescentes é um fato que vem se propagando assustadoramente elevando as estatísticas de uma doença que se enquadra em uma denominação internacional de epidemia global do século XXI: a obesidade, a qual associa-se a uma série de co-morbidades. A obesidade na infância e na adolescência tornou-se um problema mundial e sabe-se que o sedentarismo, somado a hábitos alimentares não apropriados, são os principais motivos de sua manifestação precocemente. Identificar possíveis problemas relacionados ao peso deve ser feito com o indivíduo ainda criança, uma vez que a prevenção e/ou o tratamento podem diminuir a propagação dessa doença. Dessa forma, um importante papel do Educador Físico é atuar de forma preventiva através da avaliação física dos índices antropométricos, no âmbito escolar. O Objetivo dessa pesquisa consistiu em traçar o perfil antropométrico dos alunos do 6º ao 8º ano do ensino fundamental (correspondente 5ª á 7ª séries), com faixa etária entre 11 e 16 anos,de ambos os sexos, estudantes de uma escola estadual situada na zona Norte de Teresina-Pi, no bairro Porenquanto. O estudo foi realizado com 300 adolescentes desta instituição durante 30 dias, entre os meses de setembro e outubro, durante os turnos da manhã, no qual foi feita uma avaliação física para mensuração do índice de massa corporal – IMC e dobras cutâneas – DC. Além disso, foi preenchidatambém uma anamnese, com o consentimento dos pais e da diretoria escolar, visando investigar a possível incidência de doenças crônicas dentro da família e examinar a freqüência de atividade física semanal dentre os alunos. Os resultados apontaram que há um índice significativamente elevado de sobrepeso/obesidade através da análise tanto de IMC quanto DC, os quais mostraram uma relação de 61,1% para doenças crônicas familiares e 43,3% para os adolescentes inativos.