09 - PHYSICAL GROWTH OF STUDENTS BETWEEN 11 AND 15 YEARS OLD FROM ELEMENTARY SCHOOL FROM THE MUNICIPAL DISTRICT OF MARECHAL CÂNDIDO RONDON PR.

ARIELE ANDRÉIA WOBETO; HERTON XAVIER CORSEUIL
Marechal Cândido Rondon PR / Brasil
arielew@hotmail.com

INTRODUCTION

The body development and its growth have essentially become noticed by society. In this way, Marcondes (1998, p.30) defines growth in a global way as the "addition of cellular, biochemical, biophysical and morphogenetic phenomena which integration is done according to a pre-determinate planning by the inheritance and modified for the environment".

Malina and Bouchard apud Guedes and Guedes (1997) agree that growth is a result from a complex mechanism onto cellular level, that could involve three different phenomena: a) a cell number increase, or "hyperplasia"; b) a cell size increase, or hypertrophy"; and c) a capacity increasing of the intercellular substances in joining cell, or "aggregation".

Guedes and Guedes (1997) reinforce the concept saying that such modification happened according to the time factor and are essentially quantitative modification. Waltrick (1996) complements informing that many are the factors that interfere in human growth as genetics baggage, nutrition, economical-social level, geographic region, physical activity among others.

For Gallahue & Ozmun (2001), the final adult height, abdomen, arms and legs length, are essentially determinate for genetic factors. Similarly, the bonyfication, the puberty beginning and the way how fat is distributed by the body are genotype products.

We know adolescence is marked by accelerated increase even in weight as well as in height. Lepre (2003) says that the first idea that achieves us when thinking in adolescence is changing/modification. Due phenomena such puberty, appointed by the ESTIRÃO (fast growth), with the appearing of pubian fur, male voice changing, breast rise in girls, sexuality explosion, etc… That's why it is needed the necessity of evaluating a specific population and with this to create a parameter of regional evaluation.

According to Lepre (2003), some authors also say the behavior and social changing, where the adolescents could notice better the body changing, which take them to certain behavior changing. According to corporal changing, we believe that due to physical level, they are relatively universal, with some variation.

According to Tanner apud Corseuil (1998) the physical growth is an important referential to evaluate health of the individuals and population, especially in countries under development process. We could evaluate growth through clinical, physical and biochemical methods, although the anthropometry is the most used one.

Following this way, Malina and Bouchard (1991), clarify that stature measurement and corporal weight. The growth pattern according to age range is usually alike in all children. However, the height acquired in a certain age and the period that the fast growth happens varies considerably.

Guedes and Guedes (1997) assure that as information reference according to stature and weight, the evaluation of somatic growth of a population must be done based in comparison with indicated referential. The Mundial Health Organization has oriented as indicated referential for analysis of the mundial somatic growth, the stature and weight results obtained through a study developed by National Center Health Statistics (NCHS). Moura (1993), however, says that any table or formula can be considered as an in unquestionable pattern of normality. There's an individual variation that cannot be forgotten, determinate for many causes, among them the inheritance, race, sex, weather and family environment.

In the city of Marechal Cândido Rondon, studies have already been done about the scholar growth, however, in what touches the fast growth, the developed material is rare, and, on this way, knowing the importance and precision of research work, marked the realization necessity of such study that it could develop a more criterious work with the scholar ones, because the same one will provide a sum of useful information about physical alteration during this critic development period which growth become the "first biological mark of adolescence" (GALLAHUE and OZMUN, 2001: 409).

On this way, considering the points exposed above and comprehending that adolescence is a period of somatic changing that interferes directly into the individual life, aiming analyzing the students' physical growth from fundamental teaching level, with the age between 11 and 15 years old from the municipality of Marechal Cândido Rondon-PR, due the fast growth behavior, as well as verifying the perceptual of children final stature adequation (genetic target).

METHODS AND MATERIALS

This study aims to analyze the physical growth of students from 11 to 15 years old from both sexes in the municipality of Marechal Cândido Rondon-PR. It's about a transversal study with descriptive statistics treatment. The sample is constituted of 731 persons, from these 361 were from female sex and 370 from the male sex, both classes were distributed among centesimal ages from 11 to 15. The showing method used was the casual or aleatorious ones where the schools and a group of each grade were drawled.

The research involved variables that tried to evidence the characteristics of physical growth of the students. They are: sex and age (centesimal), stature (cm), corporal weight (kg) and parents' stature (cm).

The stature measure (cm) was collected through a measuring-tape, millmetered and the use of a wood set-square. The corporal weight (kg) was obtained through an electronic balance of the brand TANITA with precision of 100g.

The parents' stature was collected through a massage sent from students to parents, which was filled in the required dada, with the purpose of calculating the target stature (final) of the participant people of the research itself.

The dada collecting was developed in schools of the elementary school achieving a sum of 5 schools. Before dada collecting, it was sent to each research participant school, a presenting letter that required the school direction permission for the effectiveness of the same one.

The used procedures for anthropometrical dada collecting were described for Petroski (1999), where the children were weighted and measured barefoot. Their weights were collected with the least possible number of clothes or with light ones.

The genetic target calculation was developed through decrypted formulas by Longui (1996):

$$TS_{boy} = ST_{father} + (ST_{mother} + 13) / 2 \qquad TS_{girl} = ST_{mother} + (ST_{father} \ 13) / 2$$

The statistical procedure for the physical evaluation growth involved a descriptive statistics: average, pattern average deviation, frequency distribution and perceptual. For the evaluation of genetic target, the dada
were organized in tables according to age and percentile adequation of the respective genetic target.
Initially, for dada bank organization, it was used Excel Software for Windows, version 2.0.

DISCUSSION AND RESULTS

According to Adolescence Committee apud KREBS et al (2001) it's in the puberty that the individual acquires 25% of their stature and 50% of their defined weight, facing some morphological and physiological complex alterations.

PIERSON and DESCHAMPS (1980) say that corporal growth is chiefly about cellular multiplication responsible for length, build and weight changes.

MARCONDES (1982) says that before the appearing of physiological signals that characterize the puberty maturation, starts the puberty fast growth. This phenomenon arouses a set of fluctuation on anthropometrical measure in a way that same age children can be apt in a major or minor degree due the development of endocrinal effects that differ qualitative quantitative one from other ones.

Table 1: comparison of average stature of both sexes.

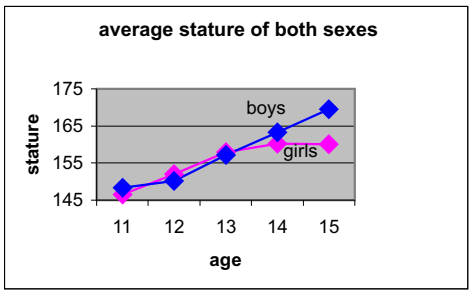
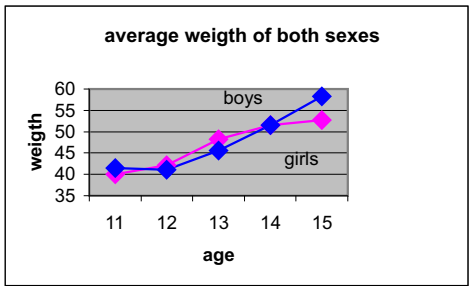


Table 2: comparison of average weight of both sexes.



There's a fast growth process that starts at the age of 11 and apparently stabilizes at the age of 14, increasing about 6 centimeters/year at the age from 11 to 13 years old. Compared to average values of the age of 14 and 15 years old, there isn't apparently significant difference, what takes us to conclude that the fast growth stature process achieved its limit.

The weight increase in educated girls was apparently major from 12 to 13 years old who gained about 6 kilos. From 13 to 14 gained about 3 kilos and then at the age of 15 they showed an average weight of only 1 kilo higher than the average range before, marking a process of apparent stabilization.

Analyzing the tables above referent to boys anthropometrical dada average values, it can be concluded that as we find in literature, the dada seem denounce a faster growth that starts about 12 years old and ends up about 16 years old for boys.

In this period, according to the study and to the literature, there is an average increase of 6 centimeters/year, where it is found in the sample higher increase of stature from 12 to 13 years old which values are shown at 7 centimeters/year. Probably, as literature shows, boys don't achieve their stature limit at 15, but the analyzed students had the age limit of 15.

The corporal weight behavior for the boys has also showed apparently risen from 12 years old, and had average increases of 6 kilos/year, showing their highest level index in the sample from 14 to 15 years old which increased about 7 kilos.

Comparing girls to the opposite sex, it can be concluded that boys at 11 years old are apparently heavier and taller than girls at this age. However, at 12, the results are the opposite, and girls come to leadership even in weight as in stature. At 13 years old, the stature difference is not different, although the corporal weight values are still superior.

At the age of 14, the weight difference between both sexes are not different, however boys' stature is already shown with superior values than in the opposite sex. In this age of 15 years old, such superiority of average values between boys and girls is already favorable to boys. Such differences are probably due to the fact that the fast growth starts earlier for girls and last about 2 years for boys. However when girls have already achieved their stature limit, boys keep on showing stature and corporal weight increase.

Genetic Target

Comparing the exposed values the table below, it can be done an analyze referring to the studied girls. It can be observed that girls show each year, a higher adjust to respective genetic target that means, they are closer to the expected stature at the end of the growing process.

Table 1: adjust percentual to girl genetic target from 11 to 15 years old from the municipality of Marechal Cândido Rondon-PR.

Age	11	12	13	14	15
70 – 80	4	-	-	3	-
80 – 90	58	13	6	-	-
90 - 100	34	82	70	59	58,5
> 100	4	5	24	38	41,5
Total	100	100	100	100	100

Table 2: adjust percentual to boy genetic target from 11 to 15 years old from the municipality of Marechal Cândido Rondon-PR.

Age	11	12	13	14	15
70 - 80	4	-	-	3	-
80 - 90	58	13	6	-	-
90 - 100	34	82	70	59	58,5
> 100	4	5	24	38	41,5
Total	100	100	100	100	100

Adjust perceptual becomes visibly arisen from 90 to 100% in boys from 11 to 13 years old, to decrease from 14 years old. But, such decrease happens due a hard increase of the index adjust >100% from 13 to 15 years old.

At the age of 11, there's a higher girl percentual that are in adjust of 80 - 90%. At 12, this higher index is in the adjustment of 90 100%, showing an apparent increase between such ages that denounce the beginning of the fast growth. From 13 years old, it is verified a hard increase in the adjust index >100% of the genetic target that keeps on increasing until 15 years old, emphasizing a higher stature than expected according to age come along.

According to the table that exposes the dada above referred to male sex, it can be verified an index of 68% of 12 year-old boys that are found in an adjustment of 80-90% of the genetic target, in this same age range, it is observed that a new increase in the adjustment index increases from 90-100% of the expected.

At 13 years old, the index is still higher in the adjustment of 80-90%, although it also increases in the adjustment of 90-100% of the target.

At 14 years old, the index becomes considerably superior in the perceptual of 90-100% of expected stature.

At 15 years old, the index in this last adjustment is higher yet, but it is verified a high percentual increase in this same age range boys that achieved more than 100% of the expected stature.

It can be inferred that according to the present dada, there is each year an increase of boys achieving each time more their genetic stature potential. However, arouse the age of 13, there are increases in the boys index that have already overcome their genetic target.

CONCLUSION

According to the shown results of the present study, it can be inferred some conclusive consideration:

In the analysis of the physical growth behavior results, it is observed that the average results for weight and stature found in the searched sample coincide to what literature says, because it was observed a linear increase about 6 centimeters/year for both sexes and weight increase that had followed the stature. When compared to other studies, the students, on a general way, describe an aptitude for normal conditions.

Boys show weight values and general stature higher than female sex, however, start the puberty period about two years later than girls, what means an age range which girls show superiority to boys in weight and stature.

Many results overcame the respective genetic potential, according to a proposed formula for such analysis, showing in this way that the environment is favorable to the physical growth or that could have been miscegenation that had provoked an increase connected to the stature according to races for having provoked a certain resistance to negative environment factors.

The environment probably is an important factor that contributes for the good student development, once factors like weather, feed, water quality, lastly, the factors that enclose life quality are present in the municipality of Marechal Cândido Rondon.

All these results indicate that adolescents of this municipality are in normal growth condition when compared to studies found in literature, however the most important is that these results can orient the Physical Education professionals when they will prepare their classes because knowing the physical, physiological and psychological transformation, their classes could developed with much more quality and safety, contributing for the motor coordination improvement, balance and other capabilities and abilities affected in this phase and not being a negative external factor that will influence their students growth.

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ARIELE ANDRÉIA WOBETO
R: 10 de abril, nº 1533, Jardim Ana Paula
Marechal Cândido Rondon PR / BRASIL
Telefones: res (45) 3284-2003 cel (42) 9112-7696 com (45) 3254-4269 tarde (45) 3277-6776 manha
arielew@hotmail.com

PHYSICAL GROWTH OF STUDENTS BETWEEN 11 AND 15 YEARS OLD FROM ELEMENTARY SCHOOL FROM THE MUNICIPAL DISTRICT OF MARECHAL CÂNDIDO RONDON PR.

ABSTRAT

The adolescence is a period of extreme transformations. It's marked for its increasing of weight and height, because in this period there are some phenomena as that one called puberty. This study had the purpose of analyzing the physical growth of students from elementary school from the Municipal district of Marechal Cândido Rondon PR. The sample is composed of 731 people, from these, 370 are male and 361 are female. This research involved facts that tried to bring out the characteristics of the students' physical growth, as: sex, age, height, weight and their parents' height. To collect the dates, we used the procedures described by PETROSKI(1999) and the form of the genetic target was from LONGUI (1996). The results showed a tendency of normality when compared to those references found in the literature. And for the genetic target there were found many valuers apparently higher than the potential waited. It can be also said that the environment is propitious to the physical growth or that some ethnic mixtures happened, which has turned the growth less influenceable to the outside facts.

KEYWORDS: genetic target, adolescence, fast growth.

CROISSANCE PHYSIQUE D'ECOLIERS DE 11 A 15 ANS D'ENSEIGNEMENT FONDAMENTAL DE MARECHAL CÂNDIDO RONDON PR

RESUME

L'adolescence est une période d'intenses transformations. Elle est marquée par augmentations accélérés tant au poids qu'au hauter, puisque ils arrivent des phénomènes comme la puberté, qui est marquée pour un croissance rapide. Cet étude a eu la finalité d'analyser le croissance physique d'écoliers d'enseignement fondamental d'onze à quinze ans d'âge des

deux sexes de la ville de Marechal Cândido Rondon PR. L'échantillon est de 731 sujets, 370 du sexe masculin et 361 du sexe féminin. L'ênquete s'est engagée des variables qui cherchent accentuer les caractéristiques de croissance physique des écoliers. Sont-elles: sexe et âge, stature (cm), poids corporel (Kg) et stature des parent (cm). Pour la réunion des données ont été utilisés les procédures décrits par PETROSKI (1999); et, la formule de cible génétique utilisé a été la formule de LONGUI (1996). Les résultats montrent une tendance à normalité quand confrontés aux références rencontrés dans la littérature. Sur le cible génétique, plusieurs valeurs qui ressemblent supérieurs au potentiel espéré onte été rencontrés. Alors, on peux inférer que l'ambiant est favorable au croissance physique ou qu'il y a eu des mélanges éthniques qui ont devenu le croissance aves moins influence aux facteurs externes.

MOTS CLE: adolescence, croissance rapide et cible génétique.

CRECIMIENTO FÍSICO DE LOS ESTUDIANTES DE 11 LOS 15 AÑOS DE LA EDUCACIÓN BÁSICA DE MARECHAL CÂNDIDO RONDON PR

RESUMEN

La adolecencia e un período de transformacione intensa. E marcada por los aumentos acelerados en tal manera en el peso cuánto en la altura, pué ocurren fenómenos como la pubertad, marcada por la distancia (crecimiento rápido). Este estudio que tenía el propósito de analizar el crecimiento físico de estudiantes de la educación básica de 11 los 15 años de la edad de ambos los sexos de la ciudad de Marechal Cândido Rondon Pr. La muestra es constituída de 731 sujetos, sendo 370 del sexo masculino y 361 del sexo femenino. La investigación implicó variable que buscán evidenciar la característica del crecimiento físico de los estudiantes .Son ellos: sexo y edad (centesimal), estatura (centímetro), peso corporal (kilogramo) y estatura de los padres (centímetro). Para la recogida de datos habían sido utilizados los procedimientos descritos por PETROSKI (1999) y el fórmula usado de la blanco genética e taba de LONGUI (1996). Los resultados habían evidenciado una tendencia a la normalidad en comparación con los referenciais encontrados en literatura. Cuánto a la blanco genética, muchos valores superiore al potencial esperado habían sido encontrados, pudiendo se deducir que el ambiente es favorable al crecimiento físico o que habían tenido mixtura étnica que e habían convertido en el crecimiento menos influenciable a los factore externos.

PALABRA - LLAVE: adolescencia,distancia (crecimiento rápido) y blanca genética.

CRESCIMENTO FÍSICO DE ESCOLARES DE 11 A 15 ANOS DO ENSINO FUNDAMENTAL DE MARECHAL CÂNDIDO RONDON PR

RESUMO

A adolescência é um período de intensas transformações. É marcada por aumentos acelerados tanto no peso quanto na altura, pois ocorrem fenômenos como a chamada puberdade, marcada pelo estirão (crescimento rápido). Este estudo teve por finalidade analisar o crescimento físico de escolares do ensino fundamental de 11 a 15 anos de idade de ambos os sexos do Município de Marechal Cândido Rondon PR. A amostra constitui-se de 731 sujeitos, sendo 370 do sexo masculino e 361 do sexo feminino. A pesquisa envolveu variáveis que procuram evidenciar as características de crescimento físico dos escolares. São elas: sexo e idade (centesimal), estatura (cm), peso corporal (kg) e estatura dos pais (cm). Para a coleta de dados foram utilizados os procedimentos descritos por PETROSKI (1999) e a fórmula de alvo genético utilizada foi a de LONGUI (1996). Os resultados evidenciam uma tendência à normalidade quando comparados aos referenciais encontrados na literatura. Quanto ao alvo genético, foram encontrados muitos valores aparentemente superiores ao potencial esperado, podendo-se inferir que o ambiente é favorável ao crescimento físico ou que houve miscigenações étnicas que tornaram o crescimento menos influenciável aos fatores externos.

PALAVRAS CHAVE: adolescência, estirão de crescimento e alvo genético.