

137 - GYMNASTICS - GIRLS BEGINNERS - LIKELIHOOD OF GROWTH AND BMI

ADRIELLE MARONNA
LUISA RODRIGUES
MÁRCIA ALBERGARIA

Universidade Estácio de Sá; LAFIEX - Campus Akxe
Rio de Janeiro/RJ - Brasil
mba2802@gmail.com

INTRODUCTION

Artistic Gymnastics (AG) is considered one of the most complete sports and also one of the most popular (SILVA, COELHO E NASCIMENTO, 2007). This sport is characterized in relation to physical capabilities, by movements of strength, agility, flexibility, coordination, balance and body control. Regarding the psychological aspects are most important: perseverance, confidence and discipline in different equipment and defying the laws of physics. A variety of exercises helps the development of GA in the cognitive domain of the body. TSUKAMOTO E NUNOMURA, 2003). The sport initiation can be defined as the first step in sports training, trying to teach the basics and to adapt one or more sports (BOMPA, 2000 apud NUNOMURA E TSUKAMOTO, 2005). At first, the focus is on improving balance, coordination and posture (DA SILVA, E COELHO E NASCIMENTO, 2007). The physical activity should begin in childhood, according to the stage of development where the child is. It is necessary for growth and physical development of the individual (OLIVEIRA, LOPES AND RISSO, 2003). Regular exercise and good nutrition are very important for proper growth. Exercise increases bone density and width, but has little or no influence on bone growth related to the length (LEITE JUNIOR, 2005). Through anthropometric analysis, the growth is the increase and the changes of body components, both longitudinal and cross sections, and the faster phase is adolescence (SILVA, SILVA DE OLIVEIRA JUNIOR, 2005). Every individual is born with a genetic potential for growth that may or may not be reached depending on the conditions of life from birth to adulthood. One must consider that the physical growth is the result of a set of cellular phenomena, biological, biochemical and morphological, and the environment as an influence on factors such as not genetically determined, power, ethnicity, effects of weather and conditions (TANNER, 1962 apud DE OLIVEIRA, 2006). Growth is seen as increased body size, and it ends with the completion of linear growth. You could say that it is a dynamic and continuous process that occurs from the beginning to the end of life. It is regarded as one of the best indicators of child health. (MINISTERIO DA SAUDE, 2002). Often one hears the phrase, "Make a sport to grow," but it is unclear whether this statement is proven scientifically. It is a common concern among parents regarding the final height when they observe that their children are smaller than other children with their age. Therefore the physical education teachers are asked about the effects of physical exercise in relation to the growth of children and adolescents (DA SILVA et al., 2004). According to Ferreira Filho, Nunomura and Tsukamoto (2006), the factor of short stature is linked to the characteristics of the sport. The gymnasts doubt the laws of physics seeking the perfection of the exercises in various situations: in reverse, rotating at different heights and apparatus coordinating body segments. According to Smith (2003), body mass, height and head circumference are the most used measures for assessing growth during childhood. For the interpretation of these anthropometric measures is necessary to use reference standards and defined cutoff points (VASCONCELOS, 2000 apud SOARES, 2003). The variation of growth among healthy individuals can be expressed through the following logic. Ascending order of height were aligned 100 healthy girls of similar age and socioeconomic conditions suitable for full growth, chosen at random. The measure of the stature of each girl represents 1% of the total (or centile). It was the height of referred girl number 3 as the 3rd percentile of height for that specific age. The same logic is used to define other percentiles (10, 50, 97, etc..) Height for age and BMI for age. The 50th percentile is the midpoint of the series of increasing heights, with half of the children above and half below that point. (MINISTERIO DA SAUDE, 2002). The study becomes relevant by seeking a way to show parents that the initiation at sports as gymnastics, without focusing on the training to the highest level, do not create bad conditions but can increase growth hormone (GH) with physical exercise. (GODFREY et al., 2003 apud DA SILVA et al., 2004). The study intend guide parents to reduce the bias, focusing on physical activity and improve health and may contribute to the development of a healthy lifestyle reducing the incidence of disease. (HALLAL et al., 2006 apud NUNOMURA, CARRARA AND CARBINATTO, 2009). Reviews have been exposed in previous paragraphs. The aim of this study was to describe the growth status of children beginners to the practice of gymnastics and find out the test results if the gym could bring benefits to child body and not create losses to growth as is still thought by parents.

METHODOLOGY

This study design was pre-experimental. Between the two tests the groups was submitted to gymnastics classes. (THOMAS E NELSON, 2002). The study subjects were 20 volunteers, intentionally selected, female aged between 8 and 9 years prior to sexual maturation (menarche), beginners to practice gymnastics for more than a year, an academy of Barra da Tijuca and a center of sports initiation into a college in Recreio, in Rio de Janeiro. This study followed the Guidelines for Research Using Human Subjects, Resolution 196/96 of the National Health Council, 10/10/1996. Another important aspect for growth assessment is the determination of the target parent. This concept is important because it relativizes the child's height to the height of the parents. To get the range of expected height of children, we used an equation of parental target: Girls = height of mother + ((father's height - 13.0 cm) ± 9) / 2, determining a range of 95% probability of the stature of the children of this couple when they reach adulthood. Another way to assess the growth was the rate of growth that translates into wins in a given time interval, determined by calculating the decimal time (TANNER, 1986 apud ZEFERINO et al. 2003). The Body Mass Index (BMI) was used to assess the nutritional status of children. Measurements of weight and height were combined to produce measurement of BMI, expressed as the relationship between body mass (kg) and height (in meters) through a calculation: BMI = kg / m². It is an international measure used by the WHO (World Health Organization) that was used to measure the nutritional status. To accomplish this work were observed and analyzed the curves away from the variables of height and body mass index (BMI). The absolute values of the curve WHO (2007) correspond to percentiles 15,30,50,85,97,99 were compared graphically with anthropometric parameters evaluated. To determine the height was used a stadiometer and a mechanical scale (Filizola®) for the measurement of body weight. Were made two visits to collect the data. The first collection was accomplished in a single day in a gym in Barra da Tijuca and sports center in Recreio, with children beginning the practice of AG. The post-test was performed 3 months after the pretest, with the same organization structure and measurement. There was no loss of subjects. The data collected were treated by means of quantitative procedures of descriptive statistics. We first performed the analysis of

central tendency using means and standard deviation for continuous variables. In the second step of treatment, there was a comparison between the average of the results in order to verify whether or not they differ significantly.

DATA ANALYSIS

Table 1 shows all the study variables with mean, standard deviation, maximum and minimum. It may be noted that the average BMI is normal, the average growth speed was within the normal range where the ideal is 5 and 7 cm / year, the average height for age percentile was found in the range ideal height for age (P.30 above) and the average BMI for age was found in the range of normal weight (P.30 to p.85).

	Massa Corporal	Estatura	IMC	Vel Crescimento	Percentil Estatura/Idade	Percentil IMC/Idade
Média	29,83	1,33	16,93	5,4	68,15	63
Desvio Padrão	5,15	0,05	2,87	1,27	23,87	26,16
Máxima	42	1,40	24,47	8	97	97
Mínima	20	1,20	13,17	4	15	15

Table 1: Mean, Standard Deviation, Minimum and Maximum of all study variables.

According Zeferino et al (2003), the child grows on average 25 cm in the first year, 10 cm from the second year and two years of age increases from 5 to 7 cm per year until the onset of puberty. The growth rate translates into high gain within a certain time interval, which was used three months apart, ie. 0.25 of decimal time. In Figure 1, 35% of children were below the growth rate expected for age, being 4 cm per year, 55% of children were found in the range of optimal growth rate for age, between 5 , 2 and 6.4 cm per year and 10% were located above the speed range for optimal growth of age, 8 cm per year.

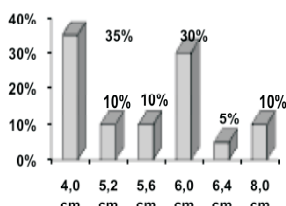


Figure 1: Percentage of Growth Speed

In Figure 2, the parent target shows that all study subjects should have normal height compared with the standards of Brazilian society, but this will depend on factors not genetically inherited that affect the final height as the date of menarche and nutritional factors. With a balanced diet and regular physical activity suggests that all reach the final height range.

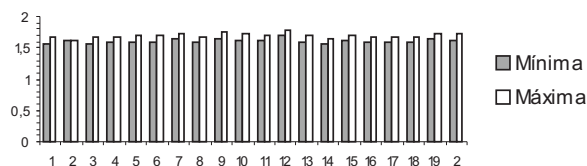


Figure 2: Maximum and Minimum Height of children related to Parental Target.

Still referring to Figure 2, can be noted that the girl on the number 14 stands out, having less parental target range, with minimum 1.55 cm and 1.64 cm maximum, and the girl on the number 12 stands out, having greater parental target range, with minimum and maximum 1.69 cm 1.78 cm. These calculations indicate the height target is away parental target, ie the time that the child could reach adulthood. As this is an estimate of genetic potential for height, results with variations up to ± 10 cm is considered normal. In general, studies for the prediction of adult height based on healthy children and usually are used in medical tests to assess and then "treat" children with apparent growth problems (LUO et al, 1998). Obviously, the projection for the adult height of the gymnast will be smaller compared to athletes from other sports.

Reference to the table of growth curves of WHO (2007) on the indices of height for age, 45% of children met the 50th percentile (figure 4), the average height for age, 30% (thirty) met the 85th percentile and 20% (twenty) in the 97th percentile or above the average height for age, these individuals were located in the range of suitable height for age (> 30th percentile) and only 5% (five), which corresponds an individual, was in the 15th percentile, classified as low height for age (> 10th percentile and <30th percentile). The socio-economic and food, although it has not been controlled in this study may have positively influenced, which means the environment as the main influencer of growth.

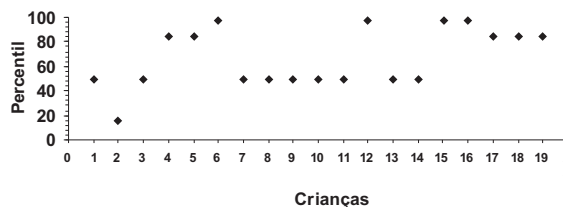


Figure 4: Percentile Height for Age

As a reference table of the growth curves of WHO (2007) on the indices of BMI for age to diagnose nutritional Figure 5, 50% (fifty) children met the 50th percentile, the average BMI for age, 20% (twenty) met at the 85th percentile, above the average BMI for age where these individuals were located in the range of normal weight (> 30th percentile and <85th percentile). Even children, 15% (fifteen) was in the 97th percentile of BMI above the mean for age, overweight range (> 85th percentile <97th percentile), 10% (ten) of the children were in the 15 percentile range that corresponds to thinness (> 10th percentile <30th percentile), 5% (five) was in the 99th percentile, above the average in the range of obesity (> 97th percentile <percentile 99.9).

The percentiles of BMI for age are useful in screening for overweight and underweight. As weight increases with height, BMI varies over time depending on age.

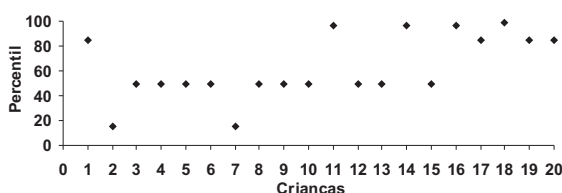


Figure 5: BMI for Age Percentile

CONCLUSIONS

Looking at the data, the averages of children led us to believe that they had anthropometric values, standards regarding the speed of growth, parental target and within the normal percentile for their ages and levels of growth. The evaluation of growth in different life stages of a human can contribute to explanations of what happened in previous stages and suggest risks to health. The short stature that is still known by all for artistic gymnastics can be explained as a gymnast to lower it is easier to perform exercises body rotation in the air, beyond the specific requirements of the sport as low weight and high load training therefore be classified as natural selection of sport where the most appropriate precedence over the other. This leads us to believe that fitness independently, such as sports initiation does not alter the normal growth of the child and should be part of the universe of experiences that every child should have as it develops valences very important for humans as balance, strength, flexibility, coordination, among others, which will be very important for the child's future not only in gymnastics, but throughout life.

The sport is not the "bad guy" or "good guy" of the history, it does not make anyone grow or shrink. Should be practiced by all based on personal pleasure, recreation and health promotion, as well as disease prevention, helps in interpersonal relationships, in her interaction with the environment, respecting the defeat to victory, overcoming their limitations and fears of loss.

REFERENCES

- BOUCHARD, C.; MALINA, R.M. **Atividade Física do Atleta Jovem: do crescimento à maturação**. 1. ed. São Paulo:Roca, 2002.
- DA SILVA, C.C. et. al. **O exercício físico potencializa ou compromete o crescimento longitudinal de crianças e adolescentes: mito ou verdade**. Rev. Bras. Med. Esporte. São Paulo, v.10, n. 6, p. 520-524, Nov./dez. 2004.
- DA SILVA, A. de Souza L.B.; COELHO, F. de S.L.A.; NASCIMENTO, S.M.M. **Avaliação Psicomotora em Crianças Praticantes de Ginástica Olímpica**. 2007. 22 f. Artigo Científico (Graduação em Lic. Plena Educação Física). Universidade Estácio de Sá, Rio de Janeiro, 2007.
- DE OLIVEIRA, J.F. **Reflexões sobre o Crescimento e Desenvolvimento em Crianças e Adolescentes**. Revista Movimento e Percepção. Espírito Santo de Pinhal, SP, v.6, n. 8, p. 49-57, jan/jun. 2006.
- FERREIRA FILHO, R.A.; NUNOMURA, M.; TSUKAMOTO, M.H.C. **Ginástica Artística e Estatura: mitos e verdades na sociedade brasileira**. Revista Mackenzie de Educação Física e Esporte. Barueri, v.5, n. 2, p.21-31, nov./dez. 2006.
- LEITE JUNIOR, O.D. **Influência Socioeconômica no Crescimento e no Desenvolvimento Maturacional de Crianças de 8 a 10 Anos de Idade da Rede Pública de Cidade do Rio de Janeiro**. 2005. 97 f. Artigo Científico (Graduação em Educação Física Plena). Universidade Estácio de Sá, Rio de Janeiro, 2005.
- LUO, Z. C.; ALBERTSSON-WIKLAND, K.; KALBERG, J. Target Height as Predicted by Parental Heights in a Population-Based Study. *Pediatric Research*, v. 44, n. 4, p. 563-571, 1998.
- MALINA, R. M. Growth, maturation, and physical activity. *Human Kinetics*. Capítulos 22 e 26, 1991
- NUNOMURA, M.; TSUKAMOTO, M.H.C. **A Idade e as Competições de Ginástica Artística Feminina**. Revista Motriz. Rio Claro, v.9, n. 2, p. 127-128, mai./ago. 2003.
- NUNOMURA, M.; CARRARA, P.D.S.; CARBINATTO, M. **Ginástica Artística Competitiva: considerações sobre o desenvolvimento dos ginastas**. Revista Motriz. Rio Claro, v.15, n. 3, p. 503-514, jul./set. 2009.
- OLIVEIRA, A.R. de; LOPES, A.G.; RISSO, S. **Elaboração de Programas de Treinamento de Força para Crianças**. **Semina: Ciências Biológicas e da Saúde**, Londrina, v.24, p. 85-96, jan./dez. 2003.
- SILVA, R.J. dos S.; SILVA JUNIOR, A.G.; DE OLIVEIRA, A.C.C. **Crescimento em Crianças e Adolescentes: um estudo comparativo**. **Revista brasileira de Cineantropometria & Desempenho Humano**. Santa Catarina, v.7, n. 1, p. 12-20. 2005.
- THOMAS, J.R.; NELSON, J.k. **Métodos de Pesquisa em Atividade Física** Porto Alegre: Artmed, 2002.
- TSUKAMOTO, M.H.C.; NUNOMURA, M. **Iniciação Esportiva e Infância: um olhar sobre a ginástica artística**. Rev. Bras. Cienc. Esporte. Campinas, v.26, n. 3, p. 159-176, mai. 2005.
- TSUKAMOTO, M.H.C.; NUNOMURA, M. **Aspectos Maturacionais em Atletas de Ginástica Olímpica do Sexo Feminino**. Revista Motriz. Rio Claro, v.9, n. 2, p. 119-126, mai./ago. 2003.
- UNESCO: International Bureau of Education, 2000. In: The following text was originally published in Prospects: the quarterly review of comparative education (Paris, UNESCO: International Bureau of Education), v. 23, n. 1/2, 1993.
- ZEFERINO, A.M.B.; BARROS FILHO, A.A.; BETTIOL, H.; BARBIERI, M.A. Acompanhamento do Crescimento. *Jornal de Pediatria*. v.79, n. 1, 2003.
- WORLD HEALTH ORGANIZATION. Growth reference 5-19 years. Disponível em: <http://www.who.int. Acesso em: 17 maio. 2010

GYMNASTICS - GIRLS BEGINNERS - LIKELIHOOD OF GROWTH AND BMI

ABSTRACT

Often is heard the phrase, "Make a sport to grow," but it is unclear whether this statement is proven scientifically. Whereas most athletes in gymnastics has short stature, it created a myth around that fact. common concern of parents with respect to final height when they observe that their children are smaller than other children the same age (DA SILVA et al., 2004). The assessment of growth was used to target parental height which puts the child up to the parents, so a certain range of height in 95% of children of this couple will reach adulthood, the rate of growth that translates into height gain at a given time interval and BMI to assess nutritional status. Were observed and analyzed the curves away from the variables of stature and body mass index, WHO / WHO (2007). This study is Pre-experimental, with volunteers intentionally selected, a female aged between 8 and 9

years beginning gymnastics artistic practice for over a year of a gym in Barra da Tijuca and a center of initiation Recreational sports in dos Bandeirantes. All patterns are used, finding within the normal range for their ages and levels of growth. Regarding the growth rate, 55% of children met at the range for age, parental target shows that all study subjects should have normal height compared with the standards of Brazilian society, for the Percentiles of the WHO (2007) of height for age 65% of children are in the range of suitable height in relation to BMI for age 70% were located in the eutrophic range. Short stature can then be explained by natural selection dictates the sport, ie, the gymnasts have a short stature because they were selected because they are naturally lower for a lower gymnast is easier to perform exercises body rotation in the air.

KEYWORDS: Parental Target, Speed Growth, BMI, Artistic Gymnastics.

GYMNASIQUE ARTISTIQUE DES FILLES DEBUTANT - POSSIBILITÉ D'AUGMENTER LA STATURE ET L'IMC RÉSUMÉ

On entend souvent l'expression, "Faire un sport pour croître", mais il est difficile de savoir si cette affirmation est prouvée scientifiquement. Considérant que la plupart des athlètes de Gymnastique artistique a une petite taille, ils ont créé un mythe autour de ce fait. Il est une préoccupation commune des parents quant à la hauteur finale quand ils constatent que leurs enfants sont plus petits que les autres enfants du même âge (DA SILVA et al., 2004). L'évaluation de la croissance, nous avons utilisé la hauteur cible des parents qui relativise la hauteur des enfants avec les parents, que détermine une intervalle de taille où 95% des enfants de ce couple atteint à l'âge adulte, le taux de croissance qui se traduit en gain de taille dans un intervalle de temps donné et de l'IMC pour évaluer l'état nutritionnel. On a observé et analysé les courbes de l'écart à partir des variables de taille et indice de masse corporelle, Le WHO/OMS (2007). L'étude est type de pré-expérimentale, avec des bénévoles intentionnellement sélectionnés, femmes avec l'âge entre 8 et 9 ans débutants dans la pratique de la gymnastique artistique pour plus d'un an d'une salle de gym à Barra da Tijuca et un centre d'initiation sports dans Recreio. Toutes les normes ont été utilisées dans la fourchette normale pour leur âge et de niveaux de croissance. En ce qui concerne le taux de croissance, 55% des enfants se sont réunis à la bonne plage pour l'âge, la cible des parents montre que tous les sujets de l'étude devraient avoir une taille normale par rapport aux normes de la société brésilienne, pour les percentiles de l'OMS (2007) de taille pour l'âge 65% des enfants sont dans la gamme de taille appropriée, en fonction de l'IMC à l'âge de 70% étaient situés dans la gamme eutrophes. La petite taille peut être expliquée par la sélection naturelle du sport, ça veut dire, les gymnastes ont une petite taille parce qu'ils ont été choisis parce qu'ils sont naturellement plus petite pour une petite gymnaste est plus facile d'effectuer une rotation du corps des exercices dans l'air.

MOTS-CLÉS: Cible des parents. La croissance de vitesse. l'IMC. De gymnastique artistique.

PRINCIPIANTE NIÑAS EN GIMNASIA ARTÍSTICA - OPORTUNIDAD DE CRECER Y EL IMC RESÚMEN

A menudo se escucha la frase, "Hacer un deporte para crecer", pero no está claro si esta declaración se ha demostrado científicamente. Considerando que la mayoría de los atletas de gimnasia tiene baja estatura, que han creado un mito en torno a este hecho. Se trata de una preocupación común entre los padres con respecto a la talla final cuando observan que sus hijos son más pequeños que otros niños de su misma edad (DA SILVA et al., 2004). La evaluación del crecimiento, se utilizó la altura del objetivo que pone a los padres al niño a los padres, por lo que un cierto rango de altura en el 95% de los niños de esta edad adulta llegar pareja, la tasa de crecimiento que se traduce en un aumento de la altura en un intervalo de tiempo dado y el IMC para evaluar el estado nutricional. Se observaron y analizaron las curvas de distancia de las variables de altura y el índice de masa corporal, la OMS / OMS (2007). El estudio es un pre- experimental, con los voluntarios seleccionados de forma intencional, mujer de edades comprendidas entre los 8 y 9 años de principiantes para practicar gimnasia durante más de un año nun gimnasio en Barra da Tijuca y un centro de iniciación deportes en Recreio. Todas las normas se utilizaron en el rango normal para su edad y niveles de crecimiento. En cuanto a la tasa de crecimiento, el 55% de los niños se reunieron en el rango correcto para la edad, el padre de destino muestra que todos los sujetos de estudio debe tener un tamaño normal para los estándares de la sociedad Brasil, por los percentiles de la OMS (2007) de talla para la edad del 65% de los niños están en el rango de tamaño apropiado, de acuerdo con el IMC a los 70% se ubicaron en el rango eutrófico. El pequeño tamaño se puede explicar por la selección natural del deporte, es decir, las gimnastas tienen baja estatura debido a que fueron elegidos porque son naturalmente más pequeño para un pequeño gimnasio es más fácil para rotar cuerpo ejercicios en el aire.

PALABRAS CLAVE: Los padres de destino. Tasa de crecimiento. IMC. Gimnasia Artística.

MENINAS INICIANTES DE GINÁSTICA ARTÍSTICA - PROBABILIDADE DE CRESCIMENTO E IMC RESUMO

Muitas vezes escuta-se a frase: "Faça um esporte para crescer mais", porém não é claro que essa afirmativa seja provada cientificamente. Considerando que a maior parte das atletas de ginástica artística apresenta baixa estatura, criou-se um mito em torno de desse fato. É comum a preocupação dos pais com relação à estatura final quando observam que seus filhos são menores que outras crianças da mesma idade (DA SILVA et. al, 2004). Para avaliação do crescimento utilizou-se o alvo parental que relativiza a altura da criança à altura dos pais, determinado assim um intervalo da estatura em que 95% dos filhos desse casal atingirão na idade adulta, a velocidade de crescimento que se traduz em altura ganha em determinado intervalo de tempo e o IMC para avaliar o estado nutricional. Foram observadas e analisadas as curvas de distância das variáveis de estatura e índice de massa corporal WHO/OMS (2007). O estudo é do tipo pré-experimental, com voluntários selecionados de forma intencional, do sexo feminino com idades entre 8 e 9 anos iniciantes a prática de ginástica artística a mais de um ano de uma academia in Barra da Tijuca e de um centro de iniciação esportiva no Recreio dos Bandeirantes. Todos os padrões utilizados se encontram dentro da normalidade para suas idades e níveis de crescimento. Em relação à velocidade de crescimento, 55% das crianças se encontraram na faixa adequada para a idade, o alvo parental mostra que todos os sujeitos do estudo deverão ter alturas normais quando comparadas com os padrões da sociedade Brasileira, em relação aos Percentis da OMS (2007) de estatura para idade 65% das crianças se encontram na faixa de estatura adequada, em relação ao IMC para a idade 70% se localizaram na faixa de eutrofia. A baixa estatura então, pode ser explicada pela seleção dita natural do esporte, ou seja, os ginastas teriam uma estatura baixa por terem sido selecionados por serem naturalmente menores para uma ginasta mais baixa é mais fácil realizar os exercícios de rotação do corpo no ar.

PALAVRAS-CHAVE: Alvo Parental, Velocidade de Crescimento, IMC, Ginástica Artística.