50 - RELATIONSHIP BETWEEN WEIGHT, HEIGHT AND MOTOR COORDINATION IN CHILDREN OF A FOOTBALL

LIZIANNE TENÓRIO DOS SANTOS[1]
MARIA ELIZABETE DE ANDRADE SILVA[2]
ELISANDRA DE ALMEIDA SILVA[3]
CASSIO HARTMANN[4]
1,2 FEDERAL UNIVERSITY OF ALAGOAS / MACEIÓ-ALAGOAS-BRAZIL
3 CESMAC / MACEIÓ-ALAGOAS-BRAZIL UNIVERSITY CENTER
4 FEDERAL INSTITUTE OF ALAGOAS / MACEIÓ-ALAGOAS-BRAZIL
lizianne_mcz@hotmail.com

Introduction

In the field of sports training with children it becomes fundamental to know all the changes that occur during the different phases of their growth. It is important to emphasize that they are not adults in miniatures, since they have specific needs and capacities (HOMRICH, 2013). Therefore, knowing and understanding such changes occurring in the human body from childhood to adulthood is of paramount importance in order to plan and structure the training appropriately to the needs at each stage of growth and development.

In this way, sports initiation provides an environment that contributes to the development of children's fundamental motor skills, but, according to Homrich (2013, p.17), they can not be allowed to move to a more advanced stage before reaching a level appropriate to the next levels of learning. Therefore, to evaluate the future athlete is to allow to have a global vision of its development, which will allow the teacher / technician a precise and effective elaboration according to the necessity of the same one.

In view of this, this study has as relevance to understand the relationship between weight, height and motor coordination in children of one of the soccer school, having as interest to know what influences this relationship in the maturation process.

In order to verify the relationship between height, body mass index (BMI) and motor coordination of children in a soccer school, the following questions were raised: 1. Identify and analyze the profile of the children according to height and body mass index (BMI); 2. Evaluate the levels of motor coordination of the participating children through the KTK (Body Coordination Test for Children) test battery and 3. Analyze the correlation between height, body mass index (BMI), and motor coordination of children .

Methodology

The sample consisted of 45 individuals, a population of 53 children in the school, aged 5 to 12 years. The following instruments were used: anthropometric measures of stature, of body mass used in the calculation of BMI following the protocol of the Manual PROESP, to verify the capacity relative to motor coordination was used the KTK test battery. Statistical analysis included a descriptive analysis of maximum, minimum, mean and standard deviation, normality was verified with the Shapiro-Wilk test and the Equivalence of variants, Test f for two variants, relevance for the variances between height and BMI (F = 15.91). The relationship was analyzed by Pearson's correlation between height, BMI and motor coordination. And Student's t-test, to verify possible differences between the same variants.

Results

The maturation of the 45 participating children was according to the Maturity Offset, and all meet before the peak of growth speed. The height-age classification, 97.78% of the sample was classified with adequate height, except for the 12 years that presents a child with low height. Weight-height the sample is with the appropriate weight, when assessed by age separately, it was observed that at 12 years a child presented with very low weight and one with very high weight. IMC-Age, it was pointed out that 66.67% of the children participating with healthy weight, only one child at 11 years old was overweight and another at age 12 is obese.

Table 1: KTK Test Classification, by age group

IDADE	Alta Coord.	Boa Coord.	Normal	Perturbação na Coord.	Insuficiência na Coord.	%
5 (n=1)	0	1	0	0	0	2,22
6 (n=1)	0	0	1	0	0	2,22
7 (n=1)	0	1	0	0	0	2,22
8 (n=7)	0	3	4	0	0	15,55
9 (n=11)	0	8	3	0	0	24,44
10 (n=6)	0	1	5	0	0	13,33
11 (n=9)	0	4	4	1	0	20
12 (n=9)	0	0	6	2	1	20
Total (%)	0%	40%	51,11%	6,67%	2,22%	

Table 2: Correlation of Variables

	ALTURA	p	IMC	p	TESTE KTK
ALTURA	1				
IMC	0,75	1,21	1		
TESTE KTK	0,33	3,03	0,28	2,56	1

Discussions

The present study aimed to verify the relationship between weight, height and motor coordination of children in a soccer school.

The sample presented children from 5 to 12 years of age in different phases, as well as their growth, development and learning, which according to Ré (2010) these processes interfere directly in motor relationships, necessitating the adaptation of environmental stimuli to them. The quantity and quality of these stimuli, at this stage, directly influence development at later ages.

Inside the school, this sample is divided according to its age group, a group from 5 to 9 years old and another group from 10 to 12 years old. It allows us to verify that teachers seek only to classify children only by their chronological age and leaves aside the physical, emotional and maturational characteristics for the sport, transforming the sport an obligation and not as part for the development of the children.

Adequate opportunities for motor practice in childhood and involvement with sports training are effective strategies for the generation of future athletes, but most of the time the physical training offered to the child is centered on competition, success and selectivity, thus occurring to early specialization.

Ramos and Neve (2008) affirm, therefore, that the teacher, as an adult and a professional, has the responsibility to create, through suitable and diversified (motivating) activities, conditions that allow the children an individualized learning within the group, allowing them to resolve conflicts in collectivity.

It is known that there are several physiological modifications for children during sports training such as cardiac muscle hypertrophy and its fibers providing strength and muscle contraction, benefits in the peripheral circulation, the endocrine system and the digestive system (BENETTI, SCHNEIDER AND MEYER, 2005).

Moderate exercise and sports training seem to stimulate normal physical growth, thus achieving the growth pattern determined by genetics. When young and healthy, these individuals show positive effects of physical training in relation to growth, thus overcoming their negative effects (FEDERATION INTERNATIONAL OF SPORTIVE MEDICINE, 1997).

In childhood, regular physical training is associated with increased bone mineral content and bone mass, apparently the most evident effect on body weight. However, in relation to the height associated with the sport, there is no visible effect, either on it or on the growth rate, and in this study it can be observed that the children investigated have adequate height and weight.

According to Pacheco and Meyer (2001), the question of the influence of sport on the child's height and bone composition is still quite complex, involving mechanical factors such as training intensity and type of sport, as well as nutritional, hormonal and genetic factors.

According to the results found in relation to the BMI, it was found that among these children participating in the research and classified as BMI as: healthy weight (BMI ± 15.97); (BMI ± 13.87) and overweight and obese (BMI ± 21.64) did not present any impairment in their motor coordination, regardless of somatic maturation, since no child had yet reached PVC.

Despite the phenomenon of childhood obesity and the increase in the level of sedentarism in children, soccer has been directing children and young people to the perspective of quality of life when related to the initiation to this sport.

According to Ronque et al. (2007), the regular practice of physical activity contributes to an improvement in several components of physical fitness related to health, favoring mainly the control of body adiposity, maintenance or improvement of functional and neuromotor capacity, which facilitates performance in several day-to-day tasks of practitioners.

Regarding sports performance, Ronque (2003) points out that in relation to health, components are developed that can offer protection against the appearance of organic disorders caused by the sedentary lifestyle.

Regarding the motor coordination levels of the children investigated, through the KTK test battery, it was verified that when analyzing motor performance, more than half of the children are in normal coordination levels (QMs = ± 113). It is clear that this test made it possible to measure motor coordination in a global way, thus making it possible to identify some motor deficit.

According to Gorla, Duarte and Montangner (2008), motor coordination has been the target of several studies, especially in the last decades, given the growing importance of the psychomotor domain for human autonomy, especially during the growth and maturation phases.

Guedes and Barbanti (1995), Braz et Arruda (2008), affirm that diagnosing motor performance levels in children provides important information for the development of motor abilities in various sports modalities, thus favoring the prevention, conservation and improvement of physical capacity .

Both genetics and the environment have an influence on motor coordination, so a lack of opportunity to explore natural movements can cause problems in motor performance as well as learning.

It is evident that the physical and sports training, within this soccer school, brings this opportunity to children contemplated in participating in their training program helping, in some way, the exploration of the movement, improving in a way their motor coordination.

The teaching of the motor skills development process is of fundamental importance, since the difficulties are related to the lack of motor experience, lack of adequate instruction, as well as the opportunity of varied practices and motivational factors (CATENASSI et al., 2007).

All this discussion becomes clear when one observes the data obtained by the correlation between height, BMI and KTK test. In the analysis of the relationship between height and BMI, the high correlation between these variants was already expected. However, when analyzing the correlation between height and the KTK test such as BMI and KTK, no significant correlation was found in the overall analysis of the children in the sample.

Recent studies seek to examine the influence of these structural features on motor aspects. Nunes et al. (2009) apud Catenassi et al. (2007) investigated the influence of body mass, height, and body proportions on the manipulative and locomotor behavior of six- and seven-year-old children, concluding that these growth variables do not exert a significant influence on the performance of basic motor skills.

It is clear the independence of performance in tasks of motor skills, as well as anthropometric variables and body composition. In fact, it was possible to observe that children with very low or low height; with very low or very high weight; underweight, overweight or obese, are able to perform movements of the same quality as normal or with adequate weight.

According to Catenassi et al. (2007), differences in performance among children should probably be more related to physiological responses than to movement organization and motor development, which should be verified in future studies.

Conclusion

From this study, it was possible to conclude that there is only a significant correlation between height and BMI, a result already expected by the relationship existing through the BMI formula. However, the independence of the height and BMI variables in relation to the KTK Test with the children participating in the sample is evident, given its insignificant value for such a correlation.

Another point raised by this study was that, in identifying and analyzing the children's profile regarding height-age, weight-height, BMI-Age and the KTK Test, presenting to teachers of this soccer school that this sport should be presented in terms of their learning in a planned and continuous way in relation to their development and in an integral way without regular commitment with competitions.

The search is in the redirection of competitions and training not only by chronological age, but also through the physical, emotional and maturational characteristics for soccer within this school as of others, so that the sport does not become an obligation, but it is part of the child's development process.

References

BENETTI, G.; SCHNEIDER, P.; MEYER, F. Os Benefícios do esporte e a importância da treinabilidade da força muscular de pré-puberes atletas de voleibol. Revista Brasileira de Cineantropometria e Desempenho Humano. Universidade Federal do Rio Grande do Sul. Laboratório de Pesquisa do Exercício – LAPEX. Rio Grande do Sul. V.7, n.2, p.87-93, 2005.

BRAZ, T. e ARRUDA, M. Diagnóstico do desempenho motor em crianças e adolescentes praticantes de futebol. Revista Movimento e Percepção. V.9, n.13, p.7-30, 2008.

CATENASSI, F.,et al. Relação entre índice de massa corporal e habilidade motora grossa em crianças de quatro e seis anos. Revista Brasileira de Medicina do Esporte. V.13, n. 4, p.227-230. 2007.

CENTERS FOR DISEASE CONTROL AND PREVENTION. Healthy Weight. Atualização: 15 Mai. 2015. Disponível em: https://www.cdc.gov/healthyweight/assessing/bmi/childrens_bmi/about_childrens_bm i.html. Acesso em: 10 nov.2017.

FEDERAÇÃO INTERNACIONAL DE MEDICINA ESPORTIVA. Treinamento físico excessivo em crianças e adolescentes. Revista Brasileira de Medicina do Esporte. V. 3, n.4, p. 122-124, 1997.

GAYA, A. e GAYA, A. Projeto Esporte Brasil: Manual de testes e avaliação. Universidade Federal do Rio Grande do Sul. Porto Alegre. Editora Perfil. 2016.

GORLA, J.I., DUARTE, E., MONTAGNER, P.C. Avaliação da coordenação motora de escolares da área urbana do Município de Umuarama-PR/Brasil. Revista Brasileira de Ciências e Movimento. V.16, n. 2, p.57-63. 2008.

HOMRICH, L.M. Aprendizagem Motora. Caderno de Referência de Esporte. Setor de Ciências Humanas e Sociais da Representação da UNISCO no Brasil. Fundação Vale. 40 p. ISBN: 978-85-7652-159-4. Brasília. 2013.

Crescimento, desenvolvimento e maturação. Caderno de Referência de Esporte. Setor de Ciências Humanas e Sociais da Representação da UNISCO no Brasil. Fundação Vale. 42 p. ISBN: 978-85-7652-157-0. Brasília. 2013.

RAMOS, A.M.; NEVES, R.L.R. A iniciação esportiva e a especialização precoce à luz da teoria da complexidade – notas introdutórias. Pensar e Prática. V. 11, n. 1, p. 1 – 8, 2008.

RÉ, A.H.N.; et al. Relações entre crescimento, desempenho motor, maturação biológica e idade cronológica em jovens do sexo masculino. Revista Brasileira Educação Física e Esporte, v.19, n.2, p.153-62, 2005.

Crescimento, maturação e desenvolvimento na infância e adolescência: Implicações para o esporte. Revista Motricidade. V.7, n. 3, p.55-67, 2010.

PACHECO, I. e MEYER, F. A influência do esporte na estatura final em crianças. Revista Perfil. p, 19 – 25. 2001.

Crescimento, maturação e desenvolvimento na infância e adolescência: Implicações para o esporte. Revista Motricidade. V.7, n. 3, p.55-67, 2010.

Abstract

This study aimed to verify the relationship between height, body mass index (BMI) and motor coordination of children in a soccer school. The sample consisted of schoolchildren aged 5 to 12 years, totaling 45 children in a population of 53. The anthropometric measurements to measure height and BMI were based on the PROESP Manual and the KTK test battery, proposing to measure the capacity of motor coordination. The statistical treatment included the maximum, minimum, mean and standard deviation calculations. For normality we used the Shapiro-Wilk test and the equality of variants, the test f for two variants, relevance for the variances between height and BMI (F = 15.91). Correlation was analyzed by Pearson's correlation between height, BMI and motor coordination, observing only a significant correlation between height and BMI (r = 0.75, p = 1.21, n = 45). And Student's t-test, to verify possible differences between the same variants. According to the results, there was a significant difference in level of p <0.05 in relation to height and BMI. It was concluded that there was only a significant correlation between height and BMI, a result already expected by the existing relationship through the BMI formula. From the results presented, it is believed that they can help the teachers / coaches in the soccer school in the elaboration of the training programs, being clear the importance of respecting the phases of growth, development, learning and biological maturation.

Keywords: KTK Test, Football, Children.

Résumé

Cette étude visait à vérifier la relation entre la taille, l'indice de masse corporelle (IMC) et la coordination motrice des enfants dans une école de football. L'échantillon était composé d'écoliers âgés de 5 à 12 ans, totalisant 45 enfants sur 53. Les mesures anthropométriques pour mesurer la taille et l'IMC étaient basées sur le manuel PROESP et la batterie de tests KTK. proposant de mesurer la capacité de coordination motrice. Le traitement statistique comprenait les calculs maximum, minimum, moyen et écart type. Pour la normalité, nous avons utilisé le test de Shapiro-Wilk et l'égalité des variantes, le test f pour deux variantes, pertinence pour les variances entre la hauteur et l'IMC (F = 15,91). La corrélation a été analysée par la corrélation de Pearson entre la hauteur, l'IMC et la coordination motrice, en observant uniquement une corrélation significative entre la hauteur et l'IMC (r = 0,75, p = 1,21, n = 45). Et le test t de Student, pour vérifier les éventuelles différences entre les mêmes variantes. Selon les résultats, il y avait une différence significative dans le niveau de p <0,05 par rapport à la taille et à l'IMC. Il a été conclu qu'il n'existait qu'une corrélation significative entre la taille et l'IMC, résultat déjà attendu par la relation existante au moyen de la formule de l'IMC. D'après les résultats présentés, ils pourraient aider les enseignants / entraîneurs de l'école de football à élaborer les programmes de formation, en soulignant l'importance de respecter les phases de croissance, de développement, d'apprentissage et de maturation biologique.

Mots-clés: Test KTK, Football, Enfants.

Resumen

Este estudio tuvo como objetivo verificar la relación existente entre la altura, el índice de masa corporal (IMC) y la

coordinación motora de niños de una escuela de fútbol. La muestra fue constituida por alumnos de la escuela en el grupo de edad de 5 a 12 años, totalizando 45 niños en una población de 53. Las medidas antropométricas para medir la altura y el IMC tuvieron como referencia el Manual de la PROESP y la batería de prueba KTK, proponiendo medir la capacidad de coordinación motora. El tratamiento estadístico contempló los cálculos máximo, mínimo, promedio y desviación estándar. Para la normalidad se utilizó la prueba Shapiro-Wilk y la igualdad de variantes, la prueba f para dos variantes, relevancia para las variantes entre altura e IMC (F = 15,91). La correlación fue analizada por la Correlación de Pearson entre altura, IMC y coordinación motora, observando apenas una correlación significativa entre la altura y el IMC (r = 0,75; p = 1,21; n = 45). Y el Test t de Student, para verificar posibles diferencias entre las mismas variantes. De acuerdo con los resultados, se observó una diferencia significativa a nivel de p <0,05 en relación a la altura y el IMC. Se concluye que sólo existió correlación significativa entre la altura y el IMC, resultado ya esperado por la relación existente a través de la fórmula del IMC. A partir de los resultados presentados, se cree que pueden auxiliar a los profesores / técnicos de la escuela de fútbol en la elaboración de los programas de entrenamiento, quedando clara la importancia de respetar las fases del crecimiento, del desarrollo, del aprendizaje y la maduración biológica.

Palabras claves: Prueba KTK, Fútbol, Niños.

Resumo

Este estudo teve como objetivo verificar a relação existente entre a altura, o índice de massa corporal (IMC) e a coordenação motora de crianças de uma escolinha de futebol. A amostra foi constituída por alunos da escolinha na faixa etária de 5 a 12 anos, totalizando 45 crianças em uma população de 53. As medidas antropométricas para mensurar a altura e o IMC tiveram como referência o Manual da PROESP e a bateria de teste KTK, propondo medir a capacidade de coordenação motora. O tratamento estatístico contemplou os cálculos máximo, mínimo, média e desvio padrão. Para normalidade foi utilizado o Teste Shapiro-Wilk e a igualdade de variantes, o Teste f para duas variantes, relevância para as variantes entre altura e IMC (F=15,91). A correlação foi analisada pela Correlação de Pearson entre altura, IMC e coordenação motora, observando apenas uma correlação significativa entre a altura e o IMC (r=0,75; p=1,21; n=45). E o Teste t de Student, para verificar possíveis diferenças entre as mesmas variantes. De acordo com os resultados, verificou-se uma diferença significativa em nível de p<0,05 em relação à altura e o IMC. Conclui-se que só existiu correlação significativa entre a altura e o IMC, resultado já esperado pela relação existente através da fórmula do IMC. A partir dos resultados apresentados, acredita-se que possam auxiliar os professores/técnicos da escolinha de futebol na elaboração dos programas de treinamento, ficando clara a importância de respeitar as fases do crescimento, do desenvolvimento, da aprendizagem e a maturação biológica.

Palavras-Chaves: Teste KTK, Futebol, Crianças.