

24 - CORRELATION BETWEEN ANTHROPOMETRIC VARIABLES AND PHYSICAL PERFORMANCE OF INDOOR SOCCER PLAYERS SUB-13

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INTRODUCTION

Currently many children are getting into sports training in general. We know that physical activity, when practiced safely is beneficial to child development. Encourages socialization, helps in the search for greater engagement goals, boosts self-esteem, helps to balance intake and expenditure of calories and lead to less susceptibility to diseases and illnesses (BARBOSA, 1997).

When we talk about soccer this number of athletes has grown over the years. Despite being a relatively new modality has been gaining popularity. It is practiced by millions of people around the world, both in the form of leisure and competition. In addition, in Brazil it is one of the three most popular sports (Vose, 2003).

Even with all this popularity, we still find difficulty in obtaining scientific studies related to this modality. This research is focused on sport combined with sport performance. Increasingly our children are being exposed to the competitive environment, making the sports performance ever earlier in the smaller classes (up to 13 years old). Athletes in the lower grades, who are not psychologically fit to withstand the pressure of a performance sports, are becoming objects visible, measurable and valoráveis (Vose, 2003).

This kind of sport may have more serious future consequences such as overuse injuries in training, psychological frustrations, excessive anxiety and stress due to poor results in league and lack of basic multisport (Vose, 2003). With all placed in evidence, always an athlete who is more prepared, especially physically, will take advantage over the others.

The evolution of motor performance in childhood and adolescence is strongly linked to the growth and maturation. In some situations of sports, we find young people of different maturational stages within a group training or competitive category, which might encourage those who are early in the process of biological development, and may discourage others who are late, with opportunities to become excellent athletes in the future (RE, TEIXEIRA, MASSA & BÖHME, 2003).

Thus, when conducting such a study, we sought to correlate some of the fundamental requirements for analyzing motor development, such as height, weight and body composition (BAILEY, MALINA & MIRWALD, 1986), with some variables essential to achieve a good level of sports performance (speed and power of lower limbs) (BARBANTI, 1996). Furthermore, correlations have also been created with flexibility tests in the Bench, with output speed static / released and aerobic power.

MATERIAL AND METHODS

This cross-sectional study sought to correlate anthropometric variables and physical performance in indoor soccer players male sub-13 category.

The sample consisted of 18 athletes aged 11.8 ± 1.2 years. Anthropometric data were collected, flexibility, lower limb power, agility, speed and aerobic power.

The assessment of weight and height was performed with a mechanical scale with stadiometer Wellmy R110 following the technique described by Lohmann (1981) with the athletes barefoot, dressed only in shorts.

The analysis of fat percentage was performed with the scientific Cescorf skinfold equation and Slaughter (1988) specific to gender and age group in question (PETROSKI, 1999). The total weight was fragmented bone weight, muscle weight, residual weight and fat weight (DE ROSE, 1984).

Soon after the anthropometric assessments athletes were subjected to physical tests.

To determine the flexibility test was used to sit on the bench and reach of Wells. The power of lower limbs was evaluated by tests of vertical jump and standing long jump (MATSUDO, 1998). In the analysis of the agility test was used for the square (GAYA & SILVA, 2007). To assess the speed tests were used for 20 meters (output static) and 20 meters (thrown out) and the determination of aerobic power was applied to yo-yo endurance test level I (Bangsbo, 1996).

Statistical analysis was performed with SPSS 10, using descriptive statistics and correlation of Person with a significance level $*p < 0,05$ and $**p < 0,01$.

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RESULTS

The sample showed the following results and their anthropometric data standard deviation: 43.7 ± 12.0 kg weight, height 151.6 ± 11.0 cm, BMI 18.7 ± 3.0 kg/m², 18% fat, 9 ± 6.6 , fat mass 9.8 ± 6.4 kg muscle mass 15.3 ± 3.2 kg; bone mass 9.1 ± 1.7 kg; residual mass 10.5 ± 2.9 kg and lean mass 34.9 ± 7.3 kg. All these data are compressed and best viewed in Table 1.

Table 1. Anthropometric measurements, values expressed as mean and standart deviation

	Wheight (kg)	Stature (cm)	BMI (Kg/m ²)	Body Fat (%)	Body Fat (kg)	Muscle Mass (kg)	Bone Mass (kg)	Residual Mass (kg)	Lean Body Mass (kg)
Mean	43,66	151,64	18,73	18,86	9,88	15,29	9,11	10,51	34,92
sd	11,99	11,00	3,02	6,60	6,36	3,21	1,66	2,91	7,27

Regarding the results obtained in testing engines, better seen in table 2, along with its data standard deviation, observed: 22.5 ± 6.6 cm flexibility, vertical jump 27.4 ± 4.8 cm long jump 167.1 ± 17.2 cm, 5.9 ± 0.4 s agility, speed 20 meters (static output) 3.8 ± 0.1 s, speed 20 meters (thrown out) was 3.3 ± 0.2 VO₂ max 40.6 ± 4.6 ml / kg / min.

Table 2. Motor performance, values expressed as mean and standart deviation (Sd).

	Flexibility (cm)	Vertical Impulse (cm)	Horizontal Impulse (cm)	Agility (s)	Speed (20m static)	Velocidade (20m realeased)	VO ₂ máx (ml/kg/min)
Mean	22,53	27,44	167,06	5,86	3,76	3,27	40,62
Sd	6,56	4,77	17,19	0,43	0,15	0,17	4,64

Table 3. Major correlations.

	Vertical impulse	Horizontal impulse	Speed 20m (realeased)	VO ₂ máx
Stature	,408	,492*	-,337	,397
Wheight	,206	,541*	-,037	,154
% body fat	-,302	,047	,495*	-,514*
Bone Mass	,333	,491*	-,208	,352
Residual Mass	,206	,539*	-,036	,150
Muscle Mass	,575*	,725**	-,492*	,476
Lean Body Mass	,409	,647**	-,279	,380

*p<0,05; **p<0,01.

After statistical analysis, we realized that there were no significant correlations between anthropometric variables and variables of flexibility, agility and speed. The % fat Moderate correlation ($r = -0.514^*$) with VO₂max. The weight ($r = 0.541^*$), muscle mass ($r = 0.725^{**}$), residual mass ($r = 0.539^*$) and lean mass ($r = 0.647^{**}$) were correlated with the horizontal impulse, however only the mass muscle ($r = 0.575^*$) indicated a moderate correlation with the vertical. These data can be seen en table 3, which presents only the main correlations.

DISCUSSION

This study sought to establish a correlation between the anthropometric and physical performance of soccer players under 13 category.

With the increase of early specialization more evident, there is the need to formulate specific articles. According to Borges and Barbanti (2001), since 1950 studies on motor development of children and adolescents are widely disseminated among countries. Since long time ago there is interest in obtaining information about levels of motor performance of the young population.

We could see that the anthropometric analysis did not correlate significantly with the tests of flexibility, speed and agility. The maturation therefore appears to have been decisive for the determination of a better performance in the proposed tests.

These results are similar to those obtained by Bohme (1999), which found no significant differences between young female athletes of similar chronological age, belonging to different maturational stages, and Larivière e Lafond (1986), who found no significant differences in performance tests engine between teenagers from the same team at different maturational stages. Corroborating these results, Braz and Arruda (2008) also found no significant differences between the maturity and performance in motor tests with young soccer players. The correlation has existed only when comparing groups of different chronological ages.

About flexibility, we can say that age is crafted one of the most sensitive for the study of such capability. It is precisely from 11 to 12 years that children begin to develop great strength levels and, therefore, the flexibility decreases (BRAZ and ARRUDA, 2008). Furthermore, the development of certain motor skills may involve limiting the development of another. With early maturation, the individual starts to develop more muscle mass, resulting in a shortening of muscle fibers. Another factor that may influence the results of such test (Wells Bench), which is always a part of the subjects underwent evaluation has some type of back pain or postural deviation (BRAZ and ARRUDA, 2008). Thus, a test that evaluates the length of lower limb muscle may be being distorted by the shortening of the lumbar musculature. Therefore, although different individual results, this test ends up not being as reliable at this age and therefore were not found significant correlations. But to make this statement more clearly, further studies are needed on the subject.

A test of speed dependence has considerable muscle mass and lower limb power. However, no significant correlation between this valence and anthropometric analysis were found. Thus, we conclude that other factors contributed significantly to variations that occur in the results presented by young people. Among these possible factors can be cited motivation, level of training and familiarization with the motor tasks requested (MALINA & BOUCHARD, 2002).

We know that young people with higher body mass and height have a tendency to have better results on tests of lower limb power, but agility. Together, these data are indicative that the component has a high speed motor coordination, and is therefore worth noting that during the training process, an excessive concern with capacity building conditional not necessarily result in an evolution of agility, considered one of the most important skills in different modalities, the modalities collective open (BARBANTI, 1996). Therefore, coordinative component in the age group of this research, is not as high dependence of the normal processes of growth and development, and possibly would have if we were dealing with younger children. However, to make this claim conclusively are required to perform longitudinal studies.

The percentage of fat showed moderate correlation with VO₂ max. The boys with best results in the test were those who showed less% fat. We know that increased body mass provided by a greater accumulation of fat has a negative effect on

motor performance (BÖHME, 1999). Furthermore, we know that physical activity is inversely related to the incidence of overweight and obesity, or sedentary lifestyle can lead to accumulation of fat. Physical activity also can provide, when combined with diet control, reduction of LDL-cholesterol and triglycerides, thus increasing HDL-cholesterol (SOUZA, 1997).

The weight correlated significantly with potency testing of the lower limbs. Athletes who had more lean mass and residual muscle obtained better results, corroborating studies showing that young people in more advanced maturational states have a significant advantage on measures involving skills conditional (MALINA & BOUCHARD, 2002). There is therefore a significant correlation between biological maturity and level of motor performance in some specific tests, as also observed FERREIRA, FRANCE, and MATSUDO SOUZA (1990). According to Guedes and Guedes (1996), results of power in his legs and could also be related to maturation, since a greater height provides the conditions for greater long jump due to a greater length of the lower limbs.

CONCLUSION

Despite that there are no strong correlations between anthropometric variables and physical performance variables analyzed, the athletes with lower values of % fat tend to have better aerobic power, while individuals with greater lean body mass seem to have better results on the test drive horizontal. Athletes with higher muscle mass tend to have better results in both tests of power of lower limbs. Only in valences of flexibility, speed and agility there were no significant correlations.

To finish this research, an important topic can be emphasized. Some valences correlate with demographics, some not. This category specified (sub 13), athletes with more advanced stage of maturation may be taking advantage when related to the development later. This can and should be utilized. However, we must remember that this advantage will not necessarily be maintained when these children reach adulthood and, therefore, we may have left behind a whole batch of excellent athletes who were only delayed development.

However, to make such a claim requires a more complete and comprehensive study of the situation. Therefore, one of the suggestions that follow completion of this work is the realization of new articles, both with an "n" higher, more participants, as with several categories for a better understanding of the actual correlation between maturation and performance on tests of motor performance.

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CORRELATION BETWEEN ANTHROPOMETRIC VARIABLES AND PHYSICAL PERFORMANCE OF INDOOR SOCCER PLAYERS SUB-13

ABSTRACT

The purpose of this study was to correlate anthropometric variables and physical youth indoor soccer players, category sub 13. The sample consisted of 18 male athletes, aged 11.8 ± 1.2 years. Were Performed tests of flexibility, lower limb power, agility, speed and aerobic power. For the evaluation of weight and height were used a mechanical scale with stadiometer wellmy R110, the analysis of fat percentage was performed with the scientific Cescorf skinfold equation and Slaughter, 1988; the total weight was fragmented by weight bone, muscle, and residual fat (De Rose, 1984). Statistical analysis was performed with SPSS 10, using descriptive statistics and correlation of Person with significance level $p < 0.05$. There were no significant correlations between anthropometric variables and variables of flexibility, agility and speed. The fat percentual presented moderate correlation ($r = -0.514$) with VO_2 max. The weight ($r = 0.541$), muscle mass ($r = 0.725$), residual mass ($r = 0.539$) and lean mass ($r = 0.647$) showed significant correlations with the long jump, but only muscle mass ($r = 0.575$) showed moderate correlation with the vertical. Despite that there are no strong correlations between anthropometric variables and physical performance is analyzed, the athletes with lower values of% fat tend to have better aerobic power, while individuals with greater lean body mass seem to have better results in the horizontal jump test. Athletes with higher muscle mass tend to have better results in both tests of power of lower limbs.

KEYWORDS: indoor soccer, body composition, physical performance.

CORRÉLATION ENTRE LES VARIABLES ANTHROPOMETRIQUES ET PERFORMANCE PHYSIQUE DE FOOTBAL SUB-13

RÉSUMÉ

Le but de cette étude était de corréler les variables anthropométriques et physiques des jeunes joueurs de soccer intérieur, sous-catégorie 13. L'échantillon était composé de 18 athlètes de sexe masculin, âgés de $11,8 \pm 1,2$ années. Joué tests de souplesse, la puissance des membres inférieurs, l'agilité, la vitesse et la puissance aérobie. Pour l'évaluation du poids et la taille ont été utilisées à l'échelle mécanique avec R110 wellmy stadiomètre, l'analyse du pourcentage de matières grasses a été réalisée avec l'équation Cescorf scientifiques du pli cutané et Slaughter, 1988; le poids total a été fragmentée par de l'os du poids, du muscle, et résiduelle matières grasses (De Rose, 1984). L'analyse statistique a été effectuée avec SPSS 10, utilisant des statistiques descriptives et de corrélation de la personne avec un niveau de signification $p < 0,05$. Il n'y avait pas de corrélations significatives entre les variables anthropométriques et les variables de la flexibilité, l'agilité et la vitesse. La corrélation% graisse modérée ($r = -0,514$) et la VO_2 max. Le poids ($r = 0,541$) de la masse musculaire, ($r = 0,725$) de masse, la masse résiduelle ($r = 0,539$) musculaire et la masse maigre ($r = 0,647$) ont montré des corrélations significatives avec le saut en longueur, mais seulement ($r = 0,575$) ont montré une corrélation modérée avec la verticale. Malgré qu'il n'y ait pas de fortes corrélations entre les variables anthropométriques et la performance physique est analysé, les athlètes avec des valeurs inférieures de% de matières grasses ont tendance à avoir une meilleure puissance aérobie, tandis que les individus avec une plus grande masse maigre du corps semblent avoir de meilleurs résultats dans l'épreuve du saut horizontal. Les athlètes ayant une masse musculaire plus élevé tendent à avoir de meilleurs résultats dans les deux tests de puissance des membres inférieurs.

MOTS-CLÉS: soccer, La composition corporelle, La performance physique.

CORRELACIÓN ENTRE LAS VARIABLES ANTROPOMÉTRICAS Y RENDIMIENTO FÍSICO DE LOS JUGADORES FÚTBOL SALA SUB-13

RESUMEN

El propósito de este estudio fue correlacionar las variables antropométricas y los jugadores jóvenes físicos fútbol de salón, categoría sub 13. La muestra consistió de 18 atletas de sexo masculino, con edades entre $11,8 \pm 1,2$ años. Realizaron pruebas de flexibilidad, menor consumo de energía del miembro, la agilidad, la velocidad y la potencia aeróbica. Para la evaluación de peso y talla se utilizó una escala mecánica con R110 estadiómetro wellmy, el análisis del porcentaje de grasa se realizó con la ecuación slaughter, 1988, el peso total fue fragmentado por el peso del hueso, músculo, y residual grasa (De Rose, 1984). El análisis estadístico se realizó con SPSS 10, utilizando una estadística descriptiva y correlación de la persona con nivel de significación $p < 0,05$. No hubo correlaciones significativa entre las variables antropométricas y las variables de flexibilidad, agilidad y velocidad. El% de grasa correlación moderada ($r = -0,514$) y el VO_2 máx. El peso ($r = 0,541$), la masa muscular ($r = 0,725$), masa residual ($r = 0,539$) y la masa magra ($r = 0,647$) mostraron correlaciones significativas con el salto de longitud, pero sólo la masa muscular ($r = 0,575$) mostraron una correlación moderada con la vertical. A pesar de que no existen fuertes correlaciones entre las variables antropométricas y el rendimiento físico se analiza, los deportistas con valores más bajos de% de grasa tienden a tener mejor la potencia aeróbica, mientras que los individuos con mayor masa corporal magra parecen tener mejores resultados en la prueba de salto horizontal. Los atletas con masa muscular más altos tienden a tener mejores resultados en ambas pruebas del poder de los miembros inferiores.

PALABRAS-CLAVE: fútbol sala, composición corporal, rendimiento Físico.

CORRELAÇÃO ENTRE VARIÁVEIS ANTROPOMÉTRICAS E DESEMPENHO FÍSICO DE ATLETAS DE FUTSAL SUB-13

RESUMO

O propósito do estudo foi correlacionar as variáveis antropométricas e físicas de jovens atletas de futsal, categoria sub 13. A amostra foi composta por 18 atletas do sexo masculino, com idade $11,8 \pm 1,2$ anos. Foram realizados testes de flexibilidade, potência de membros inferiores, agilidade, velocidade e potência aeróbia. Para a avaliação do peso e estatura foi utilizada uma balança mecânica wellmy R110 com estadiômetro, a análise do percentual de gordura foi realizada com o adipômetro científico cescorf e equação de slaughter, 1988; o peso total foi fragmentado em peso ósseo, muscular, residual e gordura (De Rose, 1984). A análise estatística foi realizada com o software SPSS 10, utilizando estatística descritiva e correlação de Person com nível de significância $p < 0,05$. Não existiram correlações significativas entre as variáveis antropométricas e as variáveis de flexibilidade, agilidade e velocidade. O % de gordura apresentou correlação moderada ($r = -0,514$) com o VO_2 máx. O peso ($r = 0,541$), massa muscular ($r = 0,725$), massa residual ($r = 0,539$) e massa magra ($r = 0,647$) apresentaram correlações significativas com a impulsão horizontal, no entanto somente a massa muscular ($r = 0,575$) indicou correlação moderada com a impulsão vertical. Apesar de não ocorrerem fortes correlações entre as variáveis antropométricas e de desempenho físico analisadas, os atletas com menores valores de % de gordura tendem a possuir melhor potência aeróbia, enquanto que indivíduos com maior massa magra parecem dispor de melhores resultados no teste de impulsão horizontal. Os atletas com massa muscular mais elevada tendem a apresentar melhores resultados em ambos os testes de potência de membros inferiores.

PALAVRAS-CHAVE: futsal; composição corporal; desempenho físico.