43 - MOTOR PERFORMANCE AND BODY ADIPOSITY IN FEMALE CHILDREN AND ADOLESCENTS

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INTRODUCTION

The word health should not be understood only as the absence of disease but as a state of physical, social and psychological well-being (GUEDES and GUEDES, 1993).

In childhood and adolescence there is a gradual increase in fat mass and lean body mass. Therefore, it is important to control these variables for a better identification of health problems associated with low or high levels of body fat (RONQUE et al, 2007). Some studies show a positive association between physical activity and health status of children and emphasize that a sedentary lifestyle has increased over the years and may be a risk factor for diseases such as hypertension, obesity and coronary heart disease (BOELHOUWER and BORGES, 2002).

Ronque, et al (2007) notes that about 50% of obese people during adolescence become obese adults and about 1/3 of obese adults had already had this situation installed in childhood. While in developed countries there is a negative association between obesity and socioeconomic status, in developing countries this association is positive (BRACCO et al, 2002). An estimate of World Health Organization noted that in 2003 the number of overweight adults surpassed one billion and at least 300 million of these were obese and its predominance is increasing worldwide, included in developing countries (FUKUYAMA et al, 2005).

Excess of weight in adolescence and worsening health in adulthood have a positive correlation, as excess of body fat, besides being a risk factor for several diseases, affects physical performance. Therefore, obesity should be diagnosed in children and adolescents during school stage, because it complicates the process of physical growth and learning. In addition, during school stage the motor acquis is construct and how there's an increase of overweight and obesity in this stage, it is important to know if the amount of body fat affects the motor performance of these students. This function is mainly designed to Physical Education professionals, who must diagnose and assist in promotion of the quality of life of these individuals (DARONCO et al, 2005).

It's significant the number of scientific studies that seek information related to motor performance in young people by the fact that a good motor performance is a fundamental attribute of motor behavior in children and adolescents. Although, there is a great difficulty in interpreting the results produced, for involves factors such as cultural and environmental aspects, growth processes, development and maturation, being difficult to show the contribution of each factor on motor activities (OKANO et al, 2001).

From the foregoing, the purpose of the current study is to compare the level of motor performance and the level of adiposity in female children and adolescent in schools from the municipality of Rio de Janeiro.

METHODS

Sample: 91 female students (12.3±1.48 years), belonging to private and public schools from the city of Rio de Janeiro, participated in this study.

Anthropometric Assessment: In accordance with the rules of ISAK – International Society for Advancement in Kinanthropometry (Norton & Olds, 2000), it was obtained measures of height (CARDIOMED stadiometer, 1 mm), total body mass (SHOENLE electronic scale, 50 g) and skinfolds thickness (CESCORF skinfold, 0.1 mm). From these data, the body fat percentage was calculated in conformity to Slaughter (1988), being this classified according to Lohman (1987). The criteria adopted for determining obesity were the values $\geq$25.01%.

Motor Tests: They compose the proposal of Committee for the Development of Sport of the Council of Europe – Eurofit (MARINS & Giannichi, 2003), which are: flamingo balance test (static general equilibrium), standing broad jump (power of lower limbs in the horizontal plane), sit ups (efficiency of abdominal muscles), handgrip (handgrip strength), shuttle run (running speed), plate tapping (speed of the upper limbs), bent arm hang (strength of upper limbs and shoulder girdle), sit and reach (flexibility of the lower limbs), endurance shuttle run (running with change of direction) and rule test (speed of reaction of the hand in response to a visual stimulus).

The motor tests and anthropometric measurements were conducted by a team, previously trained in the selected schools, during the Physical Education classes.

Statistical Analysis: We used Kolgomorov Smirnoff test to verify the data distribution and the t-Student's test was used for the comparison group, since it was established normality of the variables (SPSS 13.0, $p \leq 0.05$).

Ethical Aspects: The study followed the determination of Resolution 196/96 of National Health Council with a sign of informed consent form by parents or guardians and it was approved by the Ethics Committee of Hospital Universitário Clementino Fraga Filho, from UFRJ. The students were informed about the protocols before applying the tests, being free to leave the evaluations at any stage. There was no identification of the data at the time of analysis, to preserve the identity of the students.

RESULTS

Table 1 shows the values of height, total body mass (TBM) and body fat percentage of students measured. It was verified that 53 students were classified as normal weight (NW) and 38 as overweight/obesity (OO).

After analysis of the data was found that girls classified as NW obtained better results than the OO group in the shuttle run test speed, suspension bar, flamingo, sit and reach and horizontal thrust, with all differences statistically significant in these tests ($p \leq 0.05$).

Table 1: CHARACTERISTICS OF THE SAMPLE (n=91)

Classification	Height (m)	TBM (kg)	%G
Normal weight (n=53)	1,53±0,07	43,50±7,34	19,74±3,39
Overweight/obesity (38)	1,58±0,10	54,44±10,97	29,84±3,24

Values are presented as mean ± standard deviation ; TBM= total body mass ; % G= body fat percentage.

Table 2: RESULTS OF MOTOR TESTS

Tests	NW	OO	*t-Student* (p)
SIT UPS - (repetitions, 30s)	19±11,02	20,03±10,38	0,15
HANDGRIP right - (kg)	20±5,11	21,83±4,57	0,06
HANDGRIP left - (kg)	18 ± 4,44	20,11±5,21	0,11
SHUTLE RUN endurance - (time, s)	11,4±2,26	11,41±2,02	0,25
SHUTLLE RUN speed - (time, s)	23,24±3,27	25,54±2,95	**0,02***
SIT AND REACH - (distance, cm)	51±15,55	39,39±16,08	**0,02***
FLAMINGO - (number of attempts)	2±1,87	3,82±1,92	**0,01***
RULE TEST - (distance, cm)	25±7,71	26,81±5,64	0,39
PLATE TAPPING - (time, s)	13,19±5,2	14,7±4,46	0,95
BENT ARM HANG - (time, s)	7,28±11,86	4,92±8,9	**0,01***
STANDING BROAD JUMP - (distance, cm)	143,33±22,61	119,36±23,86	**<0,001***

Values are presented as mean ± standard deviation; NW= normal weight; OO= overweight/obesity. * Calculated by t-Student test, significance ($p \leq 0.05$).

DISCUSSION

The results of this study point to a better motor performance in students with NW in most part of the tests. In the study of Daronco, et al (2005) students with normal weight achieved superior results in all tests made, corroborating with the present study regarding the negative influence of body adiposity on the motor performance of these students. Thus, observed the importance of a regular program evaluation as a way to monitor health status, allowing predictions of diseases, avoiding serious consequences to health and to the process of growth and development of these children and adolescents.

There are, however, studies that do not indicate the difference found in this analysis, as the study of Catenassi, et al (2007) who found no statistically significant in relationship between BMI and motor performance in the overall analysis of children aged 4 to 6 years, but were observed gender differences in performance. The study of Fonseca, et al (1998) also found no significant association between physical activity of adolescents with normal BMI and overweight. The authors noted that the daily food consumption was higher among normal boys and girls than those with overweight.

Bracco, et al (2002) observed that obese children have higher energy expenditure than the non-obese, but have lower levels of physical activity and he's also reported that the level of maternal education has an increasingly positive association in childhood obesity.

Ildikó, et al (2007) found in his study that an extracurricular program can improve motor performance and reduce the fatty tissue of obese and nonobese children, and may be effective in overweight and obesity children, and also emphasized that in addition to exercises should include a balanced diet.

It was observed a positive relationship between lack of physical activity (such as television, for example) and increased body adiposity in children, considering that physical activity reduces the risk of obesity and regulates the balance weight (GIUGLIANO and CARNEIRO, 2004). The control of body fat may be linked to socio-cultural factors and esthetic. In Brazil, according to the literature, the assistance of TV is greater than internationally due to school day in developed countries be full-time (SILVA and MALINA, 2003).

BMI can be an indicator of obesity for adolescents, also pointing to the boys that the family influence and sedentary lifestyle are important factors in the development of overweight. In the girls seem to manifest an esthetic standard of thinness that they hit with inadequate dietary habits (FONSECA et al, 1998).

The amount of body fat may be influenced by diet and by the level of physical activity and it is probably before puberty that the sex differences in motor performance can be induced by environmental factors, and after it starts some biological factors should be considered (GUEDES and GUEDES, 1993).

Motor development can be characterized as a dynamic process, because the development of each component of the motricity shows the characteristics of non-linearity. The motor performance can be influenced by environmental factors, internal to the individual, tasks carried out, growth, maturation and motor experiences (CAETANO et al, 2005).

The physical education teachers have the function of stimulate the process of developing the motor skills of children and adolescents (CATENASSI et al, 2007).

CONCLUSION

Girls classified as normal weight, presented results of motor performance more impressive when compared to the group of overweight/obesity.

This result can be explained by the higher accumulation of fat found in the OO group, which may indicate a situation of physical inactivity. This possible situation of a sedentary lifestyle makes these girls have less motor testing, culminating with relatively lower results. Because of this, it is believed that obesity may be a limiting factor from performance of these children and adolescents.

In order to broaden the discussion on this issue it is recommended further studies where the level of physical activity

be monitored and preventive measures can be implemented in order to avoid health risks associated with overweight and obesity.

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MOTOR PERFORMANCE AND BODY ADIPOSITY IN FEMALE CHILDREN AND ADOLESCENTS

ABSTRACT

The study aimed to compare the level of motor performance and the level of adiposity in female children and adolescent in schools from the city of Rio de Janeiro. A sample of 91 girls (12.3 ± 1.48 years) aged 10 to 15 years, belonging to public and private schools during Physical Education classes through the prior authorization of those responsible, by signing the informed consent form. The study was approved by the Ethics Committee of HUCFF/UFRJ. Body composition was estimated using anthropometric (ISAK, 2001), from measurements of skinfold thickness, height and total body mass and body fat percentage calculated according to the protocol proposed by Slaughter (1988) and classified by Lohman (1987). The motor tests performed up the proposal of Eurofit (MARINS & Giannichi, 2003). In results were used Kolgomorov Smirnoff test to verify the data distribution and the t-Student's test was used for the comparison group, since it was established normality of the variables (SPSS 13.0, $p \leq 0.05$). It was found that girls classified as normal weight presented results of motor performance more impressive when compared to the group of overweight/obesity, and this comparison was statistically significant in most part of the tests.

KEYWORDS: Students, motor tests, body fat percentage.

MOTEUR ET ADIPOSITÉ PERFORMANCE DANS LES ENFANTS ET LES ADOLESCENTS FEMMES

RÉSUMÉ

L'étude visait à comparer le niveau de la performance motrice et le niveau de l'adiposité chez les enfants et les adolescentes dans les écoles de la municipalité de Rio de Janeiro. Un échantillon de 91 jeunes filles (12,3 ± 1,48 ans) âgés de 10 à 15 ans, appartenant à des écoles des écoles publiques et privées pendant les cours d'éducation physique grâce à l'autorisation préalable des responsables, en signant le formulaire de consentement éclairé. L'étude a été approuvée par le Comité d'éthique de HUCFF UFRJ. Composition corporelle a été estimée à l'aide Isak (anthropométriques, 2001), à partir de mesures de l'épaisseur du pli cutané, la hauteur et la masse corporelle totale et le pourcentage de matière grasse calculé conformément au protocole proposé par Slaughter (1988) et triés par Lohman (1987) . Le moteur tests effectués jusqu'à la proposition du Eurofit (Marins & Giannichi, 2003). Les résultats ont été utilisés Kolgomorov Smirnoff test pour vérifier la distribution des données et le test t de Student est utilisé pour le groupe témoin, puisque il a été établi la normalité des variables (SPSS 13.0, $p \leq 0,05$). Il a été constaté que les filles classées comme un poids normal a présenté les résultats de la performance moteur encore plus impressionnant lorsqu'on le compare au groupe de la surcharge pondérale / obésité, et cette comparaison a été statistiquement

significative dans la plupart des tests.

MOTS-CLÉS: Les écoliers, les essais moteur, pourcentage de graisse corporelle.

EL RENDIMIENTO DEL MOTOR Y LA ADIPOSIDAD EN NIÑOS Y ADOLESCENTES MUJERES

RESUMEN

El objetivo del estudio fue comparar el nivel de rendimiento del motor y el nivel de adiposidad en los niños y adolescentes en las escuelas en el municipio de Río de Janeiro. Una muestra de 91 niñas (12,3 ± 1,48 años) de 10 a 15 años, pertenecientes a las escuelas de las escuelas públicas y privadas durante las clases de Educación Física a través de la autorización previa de los responsables, mediante la firma del formulario de consentimiento informado. El estudio fue aprobado por el Comité de Ética de HUCFF UFRJ. La composición corporal se calcula utilizando antropométricas (ISAK, 2001), a partir de las mediciones del espesor del pliegue cutáneo, la altura y la masa corporal total y porcentaje de grasa calculado de acuerdo con el protocolo propuesto por la Masacre (1988) y ordenados por Lohman (1987) . El motor de las pruebas realizadas hasta la propuesta de Eurofit (Marins y Giannichi, 2003). Los resultados se utilizaron Kolgomorov Smirnoff para verificar la distribución de datos y la prueba t de Student fue utilizado para el grupo de comparación, desde que se estableció la normalidad de las variables (SPSS 13.0, $p \leq 0,05$). Se encontró que las niñas clasificados como de peso normal, presentó los resultados de rendimiento de motor más impresionante en comparación con el grupo de sobrepeso / obesidad, y esta comparación fue estadísticamente significativa en la mayoría de las pruebas.

PALABRAS CLAVE: Escolares, las pruebas de motor, porcentaje de grasa corporal.

DESEMPENHO MOTOR E ADIPOSIDADE CORPORAL EM CRIANÇAS E ADOLESCENTES DO SEXO FEMININO

RESUMO

O estudo teve como objetivo comparar o nível de desempenho motor e o nível de adiposidade corporal de crianças e adolescentes do sexo feminino de escolas do município do Rio de Janeiro. Participaram da amostra 91 meninas (12,3±1,48 anos) com idade de 10 a 15 anos, pertencentes a escolas das redes pública e particular de ensino durante as aulas de Educação Física mediante a autorização prévia dos responsáveis, através da assinatura do termo de consentimento livre e esclarecido. O estudo foi aprovado pelo Comitê de Ética do HUCFF da UFRJ. A composição corporal foi estimada pelo método antropométrico (ISAK, 2001), a partir das medidas de espessura de dobras cutâneas, estatura e massa corporal total e o percentual de gordura calculado segundo o protocolo proposto por Slaughter (1988) e classificado por Lohman (1987). Os testes motores realizados compõem a proposta do EUROFIT (MARINS & GIANNICHI, 2003). Nos resultados foi utilizado o teste de Kolgomorov Smirnoff para verificar a distribuição dos dados e o teste t-Student não pareado foi empregado na comparação dos grupos, uma vez que foi constatada normalidade das variáveis analisadas (SPSS 13.0; $p \leq 0,05$). Foi observado que as meninas classificadas como peso normal apresentaram resultados de desempenho motor mais expressivos quando comparadas as do grupo sobrepeso/obesidade, sendo essa comparação estatisticamente significativa em grande parte dos testes.

PALAVRAS-CHAVES: Escolares, testes motores, percentual de gordura.

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