32 - ANALYSIS OF THE FLEXIBILITY OF PRE-PUBESCENT CHILDREN FROM BOTH GENDERS AND DIFFERENT FINANCIAL CONDITIONS.

LARISSA SANTOS BATISTA;
DAVID MARCOS EMÉRITO DE ARAÚJO.
FEDERAL UNIVERSITY OF PIAUÍ-UFPI, TERESINA-PI, BRAZIL.
Larissanahid@hotmail.com

INTRODUCTION

Scientific literature uses different concepts to life quality unreservedly; however, it is a consensus to state that it includes the human life domains in six distinct areas: physical, mental, social, productive, emotional, and civic (Felce, 1997). It can be said that life quality is closely related to the individual's lifestyle.

In our capitalist, and especially consumer, culture, the occurrence of stress, depression, sedentary lifestyles, insomnia, bad food habits, obesity are some of the present consequences of this society, which are gradually worsened as time goes by, due to the badly adapted human organism to the environmental changes promoted by the present production and consuming system. (Goldenberg & Elliot, 2001; Nieman, 1999). It means that with the technological advances of our modern society, children and adolescents have become more sedentary in the last decades, increasing problems such as obesity (Ribeiro, 2001).

Studies on the differences of flexibility among individuals have taken into account genetic, cultural, and pathological factors, anthropometrical measurements, and body constitution (Guedes & Guedes, 1997). As all these factors are directly connected to life quality and the importance of flexibility has been greatly discussed in several areas, for the characterization of an individual's flexibility is multi-factor, this variable will be the main target of this study.

In view of these facts, the purpose of this work is to establish comparisons among pre-pubescent children from different gender and socioeconomic situations, who attended two educational institutions located in the city of Teresina, Piauí State, regarding the acquired flexibility level.

JUSTIFICATION

Nowadays, a more active lifestyle and with a regular practice of physical activities, is associated to a better life quality of people. Moreover, the socioeconomic condition is also a decisive factor. It is common to see children having entirely inadequate and unbalanced food habits, or with a routine in which the computer or the video game replace running, jumping, playing, as it used to be done decades ago, when we did not have this kind of technology. Thus, it can be said that the technological advancements coexist with sedentary behaviors.

The regular practice of physical activities is inversely related to the risk of diseases and it has a positive effect on life quality and on other psychological variables (Oehischlaeger, M.H.K; Pinheiro, R.T.; Horta, B.L., 2004). Children are study objects all over the world, for presenting high levels of risk behaviors, such as decreased regular frequency of physical activities, irregular food habits, and psychological disturbances (CDC, 1999). Besides, other studies have stated that physical activities frequency in childhood determines part of the physical activity levels in adulthood (Glenmard, 1994).

There is now a consensus that a good physical condition does not depend only upon satisfactory maximum aerobic endurance levels, but also upon adequate standards of muscular endurance, flexibility and upon postural stability (Buchner, 1997; Mazzeo et al., 1998; Pollock et al., 1998).

Flexibility is referred to the range of joint movement. It is manifested differently on the child, the adolescent, the adult and it tends to decrease as people grow older (Grahame, 2001). It varies according to the time of the day, the age, training, lifestyle and according to genre, with women having a greater general joint flexibility (Grahame, 2001). This distinction is in connection with the greater quantity of estrogen on the female gender and also with the development of muscular mass and a greater water and polysaccharide accumulation than on the male gender, minimizing the friction between muscle fibers. Therefore, the flexibility conditions are greater for the female gender (Zardo, 1999). Flexibility is responsible for the maintenance of the adequate joint range, for the capacity of efficient movement, facilitating and maintaining the muscles in good elasticity (Rider, et al.1991). This moving capacity presents unique features for its improvement.

Alter quotes Johns e Wright's work (1962), in which the components of joint mobility have been quantified, and the joint capsule and the ligaments have been said to be the most important factors to characterize flexibility.

The Seat and Reach test, initially proposed by Wells and Dillon in the 1950s, is commonly used to measure the flexibility of the hamstrings. It is believed that some factors can alter the result of the test: differences in proportions between the length of upper and lower limbs, mobility of the spinal column and shoulder blade abduction (Combleet & Woolsey, 1996). Thus, different Seat and Reach tests have been studied in order to eliminate these factors.

The hamstrings, a group composed of the semitendinous, semi-membranous and thigh biceps form a large muscle mass which is directly involved in the hip and knee movements (Palastanga, 2000). This group influences greatly on the pelvis anterior-posterior inclination (Kapandji, 2000), indirectly affecting the lumbar lordosis. Therefore, an altered flexibility of the hamstrings can cause significant posture dislocations and affect the function of the hip and lumbar spine joints. Hence, the application of this test is necessary in the evaluation process, since the study is aimed at children.

MATERIALS AND METHODS

The convenience sample was composed of 60 pre-pubescent children (40 of the male gender and 20 of the female) who practice recreational activities.

As an inclusion criterion, all should be healthy e between the ages of 08 and 11 years old, they should be connected in any form to the institutions and they should have been carrying out the recreational activities proposed by the teachers for at least four months. As exclusion criteria, no volunteer should present any pain, evident postural alteration, spine or lower limbs musculoskeletal disorders.

The children were divided into two groups: children on low incomes (G1) and children on higher than 4 minimum wages (G2). The groups were equally divided, 10 girls and 20 boys in each group. The information concerning age and family

income for the sample selection were provided by the institutions. An objective questionnaire was applied to define the sample according to the inclusion and exclusion criteria. On this questionnaire, the children should inform the time spent at school and what activities they performed in their free time.

G1 children live in a shelter for destitute minors, called Casa Dom Barreto. This shelter is boarding school-like. All destitute children are provided, besides lodging, food, medical, dental care, psychological and pedagogical assistance, they perform daily sports, cultural and recreational activities inside and outside the Casa Dom Barreto, and they all go to private schools in the city of Teresina.

G2 children go to a private school, called Instituto Dom Barreto. The children selected were only those whose parents' incomes reached 4 or higher than four minimum wages and who could be included into the age group established for the investigation.

The Seat and Reach Test (Johnson; Nelson, 1979) was used, quoted by Giannich and Marins (1998) with the help of Wells' footstool. The method is in accordance with the protocol described by Achour Junior (1999). Such protocol states that the instrument used is a wooden box measuring 30.5 by 30.5 centimeters, and a 50.5-centimeter length surface. On this surface the measure scale is placed, coinciding the value 23 with the position of the assessor's feet against the box. Three attempts are made; the largest of the three measurements is the valid one. According to the age of the sample, the minimum criterion established by the Physical Best proposal (1988) was 25cm for this research. The tests were performed in two days in a row and at the same time.

For the statistical analysis, a database was created in Microsoft Excel 2003 and the analysis was accomplished through SPSS 9.0. The data were grouped into average and standard-deviations, and the tables were built using absolute numbers. In order to verify the possible differences among the investigated variables, resulting from the interactions between gender and financial conditions, Student's “t” Test was used. Significance levels of 5% were determined for all analyses (or $p<0.05$).

RESULTS AND DISCUSSION

Flexibility is the only motor condition having its peak in childhood, up to 10 years old, worsening then if it is not worked properly. For this reason, flexibility training must start as soon as possible, so that there is no loss and to ensure a good elasticity in adulthood. Thus, in the third childhood, a phase beginning around six years old and extending to the beginning of puberty, the flexibility training can be started for sports reasons, demanding a high degree of development of this physical quality. By the end of this phase, the puberty spurt will normally occur, causing unnumbered hormonal, physiological and morphological alterations which will produce deep modifications on the movement biomechanics and on the muscles' distension capacity (Dantas, 1995).

Table 1.0 shows the flexibility level of the sample in a general way. The hamstrings flexibility of all children was firstly compared to that of Physical Best (1988), of 25 cm from 7 to 17 years old, for both genders, quoted by Achour Junior (1999). This proposal is a parameter of desirable standards, regarding the motor performance which may ensure any degree of protection against the rise of hipokinetic diseases and the capacity to develop the everyday tasks (Blair 1989, quoted by Guedes; Guedes, 1997). This criterion of 25 cm coincides with the zero point of Wells' footstool, that is, the position of the assessor's feet against the box.

The results show that only 53.33% of the children attained this minimum criterion. For the age established to the sample, the children did not present satisfactory values, since according to the literature, pre-pubescent children have good flexibility levels (Dantas, 1995). It must be considered that it is important not only to compare the flexibility levels, but also check if the children attain or not the standards established regarding health.

Table 1.0 Percentage of children who attained the criterion established by the Physical Best proposal (1988) of 25 cm according to gender. Teresina City, PI, 2007.

		Gender				Total	
		male		female			
		Nº	%	Nº	%	Nº	%
Attained minimum criterion (25 cm)	Yes	23	57,50	9	45,00	32	53,33
	No	17	42,50	11	55,00	28	46,67
Total		40	100,00	20	100,00	60	100,00

Source: Direct survey

Table 2.0 shows the difference in the flexibility level between the groups as to incomes. It could be observed that the average found for the G1 children, on low incomes group, was 27.87cm, and these were more flexible than the other group's children. This result can be explained by means of the questionnaire applied before performing the tests. The questionnaire showed that the destitute children were far more active, since most of them enjoyed their free time playing. The children who had a higher purchasing power enjoyed themselves only playing electronic games or sleeping.

Table 2.0 Comparison of the hamstrings flexibility degree (cm) between the groups. Teresina,PI, 2007.

			Maximum	Minimum	Average	Standard deviation
Group	Destitut children	Hamstrings flexibility	35,00	16,50	27,87	5,17
	On higher income children	Hamstrings flexibility	35,00	13,50	23,77	5,72

Source: Direct survey.

As for gender, in both groups the hamstrings flexibility level was higher in male children. In the group of destitute children, the ratio was 14 boys to 6 girls. In the G2 group, this ratio was 9 boys to 3 girls. The results do not agree to the literature, since, in a general way, women demonstrate higher flexibility levels than men, regardless the age and these differences persist throughout a person's life (Achour Júnior, 1999). The reason for that can be explained by the quantity of girls in both groups being lower. Besides, both destitute girls and boys (G1) were more flexible. See Table 3.0

Table 3.0 Percentage of children who attained the criterion established by the Physical Best proposal (1988) of 25 cm according to gender regarding the group. Teresina, PI, 2007.

		Attained minimum criterion (25 cm)				Total	
		Yes		No			
		Nº	%	Nº	%	Nº	%
male	Destitut children	14	60,87	6	35,29	20	50,00
	On higher income children	9	39,13	11	64,71	20	50,00
Total		23	100,00	17	100,00	40	100,00
female	Destitut children	6	66,67	4	36,36	10	50,00
	On higher income children	3	33,33	7	63,64	10	50,00
Total		9	100,00	11	100,00	20	100,00

Source: Direct survey.

CONCLUSION

Based on the objective proposed, it can be concluded that there was a significant difference in the children's flexibility level as regards the financial condition and gender. It means that the difference in the flexibility level between the groups, regarding financial condition, can be justified by the children's lifestyle outside recreational lessons.

As regards gender, in general terms, the male children were more flexible. It can be explained due to the quantity of girls in the groups, which was smaller than the boys. Moreover, in the G2 group, not even half of the girls could attain the minimum criterion of 25 cm established by the Physical Best proposal (1988) for this research.

It is suggested carrying out more research on the theme, with a control group within the same age group and that they do not practice any physical activity as the other groups do. Additionally, it would be interesting that both groups were equally and proportionally divided. Thus, it will be easier to analyze if there is any distinction of flexibility regarding gender and socioeconomic conditions, or if the flexibility gain occurred through the physical activities practiced.

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Avenida Pinel, 342 – Cabral. CEP: 64000-650. Teresina/PI. Fone: (86)8829-8506. larissanahid@hotmail.com.

ANALYSIS OF THE FLEXIBILITY OF PRE-PUBESCENT CHILDREN FROM BOTH GENDERS AND DIFFERENT FINANCIAL CONDITIONS.

ABSTRACT

Considering that flexibility is an important component of human performance and fitness, and it is definitely incorporated to the Physical Education definitions in all areas, this study proposes a comparative analysis among the hip flexibility of 60 pre-pubescent children (ages 8-11) from both genders and different financial conditions, residents in the city of Teresina, Piauí State, who practice recreational activities. The children were divided into two equal-sized groups: children on low incomes (G1) and the children on higher than 4 minimum wages (G2). The “Seat and Reach” Test (Johnson; Nelson, 1979)

proposed by Achour Junior (1999), was applied to evaluate the flexibility level of the children's hamstrings. For the statistical analysis, a database was created in Microsoft Excel 2003 and the analysis was accomplished through SPSS 9.0. The results showed that there was a significant difference on the children's flexibility level regarding the financial conditions. The group of children on low incomes (G1) presented a higher average (27.87 cm). As for gender, in a general way, the boys of the sample were more flexible (57.5% of boys and 45% of girls), it is due to the number of girls in the groups, which was smaller and, besides, in the G2 group only 33.33% of the girls reached the minimum criterion of 25 cm established by the Physical Best proposal (1988).

KEYWORDS: Flexibility, gender, lifestyle.

ANALYSE DE LA FLEXIBILITÉ DES ENFANTS PRE-PUBÈRE DE SEXE ET CONDITION FINANCIER DIFFÉRENTS

RESUMÉE

Fairant la consideration que la flexibilité c'est un important component de le dévelopment de l'aptitude humaine, et être definitivement incorporé a les definitions de la education fisique dans tout les champs, cette étudie désigne une analyse comparatif entre flexibilité d'hanche de 60 enfants pre-pubère (8 11 ans) de differents sexes et condition financier, resident dans la ville de Teresina-Pi, que practique activités récreatives. Les enfants ont été divisé en deux groupe de quantité égales : enfants de rente bas (G1) et enfants de pouvoir adquisitif majeur que 4 salaires minimes (G2). A été appliqué une recheche de s'assesoir-et-atteindre (Johnson ; Nelson,1979), proposé pour Achour Junior (1999), pour évaluer le niveau de flexibilité de les isquiotibiais des enfants. Par analyse statistique a été construite une banque d'info. En Microsoft Excel 2003 et l'analyse a été realisé en utilizant SPSS 9.0. Les résultats de la recherche a demontré qu-il avait différences significatives dans le niveau de flexibilité des enfants combien de condition financier. Le groupe des enfants pauvre (G1) ont presenté majeur moyenne (27,87 cm). Combien le sexe, dans une mode général, les enfants ont montré qu-ils ont été plus flexible (57,5%) de les enfants et 45% de les petites filles), ça pourquoi la cantité de petites filles dans le groupe a été inferieur et déla, en group des enfants avec rente (G2) seulement 33,33% de les petites filles ont réussi obtenir le critère minime de 25 cm fonde par la proposition de la Physical Best (1988) par cette recherche.

MOT CLÉ: Flexibilité, sexe, style de vie

ANÁLISIS DE LA FLEXIBILIDAD DE LOS NIÑOS PRE-PÚBERES DEL SEXO Y CONDICIONES FINANCIERAS DIFERENTES

RESUMEN

Llevando en consideración que la flexibilidad es un importante componente del desempeño y aptitud humana, y está definitivamente incorporada a las definiciones de la Educación Física en todos los campos, este estudio propone una análisis comparativa entre la flexibilidad del cuadril de 60 niños pre-púberes (8-11 anos) de diferentes sexos y condiciones financieras, residentes en la ciudad de Teresina-PI, que practican actividades recreativas. Los niños fueron divididos en dos grupos de cuantidades iguales: niños de baja renda (G1) y niños de poder adquisitivo mayor que 4 salarios mínimos (G2). Fue aplicado el teste de “sentar-e-alcanzar” (Johnson;Nelson, 1979), propuesto por Achour Junior (1999), para avaluar el nivel de flexibilidad de los isquiotibiais de los niños. Para análisis estadística fue construido un banco de datos en Microsoft Excel 2003 y el análisis fue realizada utilizándose SPSS 9.0. Los resultados del teste demostraron que hubo diferencia significativa en el nivel de flexibilidad de los niños cuanto a la condición financiera. El grupo de niños carentes (G1) presento mayor media (27,87cm). Cuanto al sexo, de un modo en general, los niños de la muestra fueron más flexibles (57,5% de los niños y 45% de las niñas), eso porque la cuantidad de niñas en los grupos fue inferior y, además, el grupo de niños con renda (G2) solo 33,33% de las niñas lograron el criterio mínimo de 25 cm establecido por la propuesta de la Physical Best (1988) para esta pesquisa.

PALABRAS-CLABES: flexibilidad, sexo, estilo de vida.

ANÁLISE DA FLEXIBILIDADE DE CRIANÇAS PRÉ-PUBERES DE SEXO E CONDIÇÕES FINANCEIRAS DIFERENTES.

RESUMO

Levando em consideração que a flexibilidade é um importante componente da performance e aptidão humana, e está definitivamente incorporada as definições da Educação Física em todos os campos, este estudo propõe uma análise comparativa entre a flexibilidade do quadril de 60 crianças pré-púberes (8-11 anos) de diferentes sexos e condições financeiras, residentes na cidade de Teresina-Pi, que praticam atividades recreativas. As crianças foram divididas em dois grupos de quantidades iguais: crianças de baixa renda (G1) e crianças de poder aquisitivo maior que 4 salários mínimos (G2). Foi aplicado o teste de “sentar-e-alcançar” (Johnson;Nelson, 1979), proposto por Achour Junior (1999), para avaliar o nível de flexibilidade dos isquiotibiais das crianças. Para análise estatística foi construído um banco de dados em Microsoft Excel 2003 e a análise foi realizada utilizando-se SPSS 9.0. Os resultados do teste demonstraram que houve diferença significativa no nível de flexibilidade das crianças quanto à condição financeira. O grupo de crianças carentes (G1) apresentou maior média (27,87cm). Quanto ao sexo, de um modo geral, os meninos da amostra foram mais flexíveis (57,5% dos meninos e 45% das meninas), isso porque a quantidade de meninas nos grupos foi inferior e, além disso, no grupo de crianças com renda (G2) apenas 33,33% das meninas conseguiram atingir o critério mínimo de 25 cm estabelecido pela proposta da Physical Best (1988) para esta pesquisa.

PALAVRAS-CHAVE: flexibilidade, sexo, estilo de vida.