# 133 - BODY MASS INDEX, BODY FAT PERCENTAGE, FLEXIBILITY, PHYSICAL ACTIVITY LEVEL AND SATISFACTION IN PHYSICAL EDUCATION CLASSES OF 7 AND 10 YEARS OLD CHILDREN ON PRIVATE AND PUBLIC SCHOOLS AT MUZAMBINHO-MG

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## INTRODUCTION

The prevalence of obesity has increased in most countries and become one of the most significant nutritional problems for today. Because it implies an increased risk of several chronic diseases, especially for cardiovascular, numerous initiatives are being developed to seek to reverse increase in overweight (BARROS, 2008). However, what has drawn attention, specially the researchers and professionals in health, is that this phenomenon has reached a growing contingent of children and adolescents and can cause various health disorders in early ages (ROQUE et al., 2007).

There is a strong association of obesity with physical inactivity, which in turn submits the individuals affected by this disease to a low fitness. A sedentary lifestyle and excessive intake of calories are great villains for obesity. The hypokinesia (absence of movement), is currently treated as a disease that must be eradicated. Obesity still remains unclear in many aspects, but it is known that a high level of physical activity can significantly influence the reduction of its incidence (SIMÃO, 2007).

Achour Júnior (2004) says that flexibility is a motor skill that should be targeted at school, mainly due to the time that children remain in the sitting posture, and their optimal development coincides with the early stages of life, providing favorable conditions for stretching. This statement corroborates Dantas (2005), which reports to be of 6/7 years of age until the onset of puberty, at which time they are acquired levels of flexibility you possess for life.

According to Reis, Moro and Contijo (2003) a sitting posture, coupled with the lack of physical activity is a crucial factor for the loss of flexibility and hence the emergence of low back pain.

Appropriate ranges of flexibility are able to provide children and adolescents several benefits, among them have a greater ease in performing sports movements and gestures more broadly and effectively without requiring excessive effort and muscle tension of antagonistic muscles in their implementation, also enables you to perform daily movements with greater ease (DANTAS, 2005).

Since the levels of physical activity is one of the determinants of body composition and levels of flexibility, the short time engaged in physical education classes is one of the factors that may explain the low levels of habitual physical activity in children and adolescents (TOIGO, 2007). Therefore, it is very important to make physical education classes more attractive, satisfying and therefore obtain a greater adhesion of the students (GUEDES; GUEDES, 1997).

## OBJECTIVE

The objective of this study is to compare the body mass index, fat percentage, flexibility, physical activity level and satisfaction level in physical education classes for children with 7 and 10 years old enrolled in public and private schools at Muzambinho - MG.

## MATERIALS AND METHODS

The study sample consisted of 115 children living in the district of Muzambinho-MG in both sexes in 2011 enrolled in private schools (n=37) and public schools (n=78) belonging to age group of 7 and 10 years old.

The assessment of body composition was determined by measuring the body mass of students, using an electronic Lider brand scale line P150, certified and approved by Resolution 187/2006 in accordance with INMETRO Resolution 236/98. Height was measured using a Sanny scale fixed to the wall. To assess the behavior of subcutaneous fat were measured triceps skinfold thickness (TR) and calf (PM). These measurements were performed by a single evaluator, with a scientific Cescorf brand caliper. All measurements were taken on a rotational and replicated three times, and recorded the median value. The relative body fat (BF) was estimated using the equation proposed by Slaughter et al. (1998 apud FERNANDES FILHO, 2003).

The measure of the flexibility levels was performed using the Sit and Reach protocol originally proposed by Wells and Dillon in 1952, following the Canadian standardized tests for evaluating the physical fitness of the Canadian Standardized Test of Fitness (1986). The test was performed with an Instant Pro Sanny BW2005 Wells Bank. The individual removed the shoes and sitting on the equipment touched the feet with knees extended. With shoulders bent, arms straight and hands overlapping performing flexion change on this front should touch the highest point of the scale of the Bank with his hands. There were three attempts with 30 seconds break between each one. For analysis we considered the best result.

To identify the lifestyle and level of satisfaction in physical education classes of the investigated subjects was administered the questionnaire "Typical Day Physical Activity and Food - DAFA" - modified (BARROS; NAHAS, 2003). The children answered the questions in two sessions: the first related to the level of satisfaction with the physical education classes on a scale from 1 to 5, the second with the level of physical activity on a daily basis.

## DATA ANALYSIS

The normality test of Kolmogorov-Smirnov test was used to analyze the data distribution. For comparisons between different age groups, and between the type of school they were enrolled, analysis of variance was employed by two factors ANOVA followed by Tukey post hoc test, with $p < 0.05$. The data were processed using the software SPSS Statistics version 19.

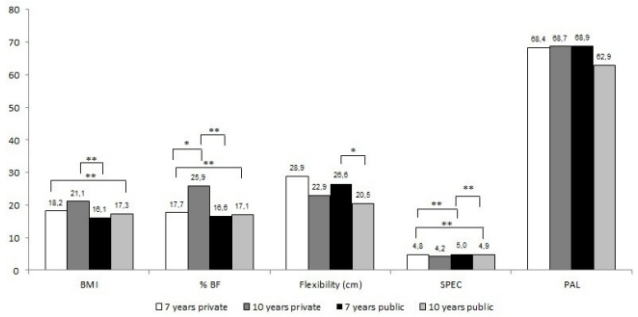
This study followed the recommendations of Resolution 196/96 of the National Health Council for studies in humans.

## RESULTS AND DISCUSSION

The results are shown in Figure 1.

FIGURE 1 - BMI, BF%, levels of flexibility, satisfaction in physical education classes and physical activity level for 7

and 10 years old children enrolled in private and public schools.




Legend: *=p <0.05, **=p <0.01, BMI=body mass index, % BF=percentage of body fat; SPEC=satisfaction in physical education classes; PAL=physical activity level.

As the figure 1, BMI was significantly higher for 7 years old children in private schools (BMI=18.2) when compared to 10 years old children of public schools (BMI=17.3) (p=0.004). Similar results were observed in 10 years old children in private schools (BMI=21.1) compared to 7 years old children from public schools (BMI=16.1), BMI was significantly higher for the latter group (p<0.000). Comparing only the 7 years old, as well as the 10 years old between public and private schools have been a higher BMI for children in private schools at both ages. However, this difference was not significant.

The results found by Caputo and Silva (2009), corroborate this study because they found higher BMI results for children enrolled in private schools.

According to the modified table by Fernandes Filho (2003), the average BMI of children between 7 and 10 years old of the public schools are classified as "malnutrition" (<18.5 kg / m²) as well as children of 7 years in private schools. The 10 years old children in private are classified as "normal" (20-25 kg / m²).

The fact that the average BMI for children from the public to be classified as "malnutrition" draws attention, since that low BMI may be associated with some nutritional disorders such as nervous anorexia, especially among females and malnutrition Protein-energy affects the process of physical growth (KERRUISH et al. 2002; PROBST et al., 2001).

Figure 1 shows the results for the percentage of body fat. Values were significantly higher for 7 years old children of private schools compared with 10 years old children in the same private school (p=0.013), for 10 years old children in private when compared with 7 years old children in public schools (p=0.001) and for 7 years old children in private schools as compared to 10 years old children of public schools (p=0.001). Despite the work in question does not provide the amount of children who are overweight or obese, it was observed that children in private schools have higher values at both ages compared with children in public schools. Studies by Leão, Araujo and Moraes (2003), 30% of children in private schools have incidence of obesity, but in public schools that rate drops to 8% of children.

When discussing the variable flexibility was a significant superiority for 7 years old children compared with only 10 years old children in public schools (p 0.049).

Regardless of genre, some authors describe that flexibility decreases with increasing age (POLLOCK, WILMORE, 1993; WEINECK, 1991), as seen in the average results shown in Figure 1 of this study.

Analyzing the data related to flexibility, and compared according to the table of Pollock and Wilmore (1993), 7 and 10 years old children in private schools, and 10 years old children of public schools showed a level of flexibility considered "excellent", while that 10 years old children of public schools had a flexibility classified as "good."

Comparing the results of satisfaction in physical education classes, have a significantly higher satisfaction rate among children aged 7 years old than the 10 years old in private school (p = 0.000). 7 years old children of the private schools are significantly more satisfied with the physical education classes than 7 years old children (p=0.000) and 10 years old children (p = 0.000) from the public school. Contemporary society should be concerned with the results of research like the study in question, because according to Godin and Shepard (1986), dissatisfaction shown by children in physical education classes has increased over the years, it has links with the future habits of physical activity among adolescents.

In relation to physical activity level was not obtained significant differences between ages and school types (public or private). This equality can be explained by Palma (2000), which in a recent study several aspects that contribute to physical activity to be practiced regardless of social class, for example, the role of the media, local culture, the influence of sport high performance, among others.

**CONCLUSION**

At the end of this study can be seen that although there are significant differences in levels of physical activity groups, children in public schools were more satisfied with the physical education classes and children from the private schools presented above BMI, % BF and flexibility.

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**ABSTRACT**

Nowadays, the world level of physical activity among young people is decreasing in proportion to the increase in the percentage of fat and worsening in the performance of motor activities. In order to investigate this, the present study aims to compare the body mass index, body fat percentage, flexibility, physical activity level and satisfaction level in physical education classes for 7 and 10 years old children in public and private schools at Muzambinho-MG. The sample comprised 115 children living in the district of Muzambinho-MG in both genres in 2011 enrolled in private schools (n = 37) and public schools (n = 78) aged as 7 and 10 years old. It was determined the body mass index (BMI), percentage fat (% BF) by skinfold triceps and calf (FERNANDES FILHO, 2003). The measure of the flexibility levels was performed using the Sit and Reach protocol (WELLS; DILLON, 1952). To determine the level of physical activity and satisfaction in physical education classes was applied questionnaire "Typical Day Physical Activity and Food - DAFA" -modified (BARROS; NAHAS, 2003). At the end of this study can be seen that although there are significant differences in levels of physical activity groups, children in public schools were more satisfied with the physical education classes and children from the private schools are presented above BMI, % BF and flexibility.

**KEYWORDS:** physical education classes, physical activity, children.

**INDICE DE MASSE CORPORELLE, POURCENTAGE DE GRAISSE CORPORELLE, FLEXIBILITE, NIVEAU D'ACTIVITE PHYSIQUE ET LA SATISFACTION COURS D'EDUCATION PHYSIQUE DE 7 A 10 ANS ENFANTS SUR LES ECOLES PRIVEES ET PUBLIQUES A MUZAMBINHO-MG**

**RÉSUMÉ**

Dans le monde d'aujourd'hui le niveau d'activité physique chez les jeunes est en baisse en proportion de l'augmentation du pourcentage de graisse et de l'aggravation de la performance des activités motrices. Afin d'étudier cette revendication de la présente étude vise à comparer l'indice de masse corporelle, le pourcentage de graisse, la flexibilité, le niveau d'activité physique et la satisfaction dans les classes d'éducation physique pour les enfants de 7 et 10 ans inscrits dans les publics et privés Muzambinho-MG. L'échantillon comprenait 115 enfants vivant dans le district de Muzambinho-MG chez les deux sexes en 2011 inscrits dans des écoles privées (n = 37) et dans le réseau public (n = 78) appartenant à l'âge de 7 et 10 ans. Il a été déterminé l'indice de masse corporelle (IMC), pourcentage de graisse (% GC) par pli cutané du triceps et du mollet (Fernandes Filho, 2003). La mesure des niveaux de flexibilité a été réalisée en utilisant le protocole Sit and Reach (Wells, Dillon, 1952). Pour déterminer le niveau d'activité physique et la satisfaction dans les classes d'éducation physique a été appliquée questionnaire «Journée type d'activité physique et de l'Alimentation - MAPA » - modifiés (Barros, Nahas, 2003). A la fin de cette étude peut être vu que même s'il ya des différences significatives dans les niveaux de groupes d'activité physique, les enfants dans les écoles publiques étaient plus satisfaits avec les classes d'éducation physique et les enfants des valeurs privées sont présentées ci-dessus IMC et %GC.

**MOTS-CLÉS**: les classes d'éducation physique, l'activité physique, les enfants.

**ÍNDICE DE MASA CORPORAL, PORCENTAJE DE GRASA CORPORAL, FLEXIBILIDAD, NIVEL DE ACTIVIDAD FÍSICA Y SATISFACCIÓN EN LAS CLASES DE EDUCACIÓN FÍSICA DE 7 Y 10 AÑOS NIÑOS EN LAS ESCUELAS PÚBLICAS Y PRIVADAS EN MUZAMBINHO-MG**

**RESUMEN**

En el mundo actual el nivel de actividad física entre los jóvenes está disminuyendo en proporción al aumento en el porcentaje de grasa y el empeoramiento en el desempeño de las actividades motoras. Con el fin de investigar esta afirmación el presente estudio tiene como objetivo comparar el índice de masa corporal, porcentaje de grasa corporal, la flexibilidad, el nivel

de actividad física y la satisfacción en las clases de educación física para niños de 7 y 10 años de edad matriculados en públicas y privadas Muzambinho-MG. La muestra está compuesta por 115 niños que viven en el distrito de Muzambinho-MG en ambos sexos en 2011 matriculados en escuelas privadas (n = 37) y en la red pública (n = 78) que pertenecen a la edad de 7 y 10 años de edad. Se determinó el índice de masa corporal (IMC), porcentaje de grasa (% GC) por pliegue cutáneo del tríceps y pantorrilla (Fernandes Filho, 2003). La medida de los niveles de flexibilidad se ha realizado mediante el protocolo de Sit and Reach (Wells, Dillon, 1952). Para determinar el nivel de actividad física y la satisfacción en las clases de educación física se aplicó cuestionario "Día Típico Actividad Física y la Alimentación - DAFA" - modificados (Barros, Nahas, 2003). Al final de este estudio se observa que si bien existen diferencias significativas en los niveles de los grupos de actividad física, los niños en las escuelas públicas estaban más satisfechos con las clases de educación física y los niños de los valores privados se presentan por encima de IMC y %G.

**PALABRAS CLAVE:** las clases de educación física, actividad física, los niños.

**ÍNDICE DE MASSA CORPORAL, PERCENTUAL DE GORDURA, FLEXIBILIDADE, NÍVEL DE ATIVIDADE FÍSICA E SATISFAÇÃO NAS AULAS DE EDUCAÇÃO FÍSICA DE CRIANÇAS DE 7 E 10 ANOS DE IDADE DA REDE PÚBLICA E PRIVADA DE MUZAMBINHO-MG**

**RESUMO**

No mundo contemporâneo o nível de atividade física entre os jovens está diminuindo proporcionalmente ao aumento do percentual de gordura e piora no desempenho das atividades motoras. A fim de investigar esta afirmativa o presente estudo tem como objetivo comparar o Índice de Massa Corporal, o percentual de gordura, a flexibilidade, o nível de atividade física e a satisfação nas aulas de Educação Física de crianças de 7 e 10 anos de idade matriculadas na rede pública e privada de Muzambinho-MG. A amostra composta por 115 crianças residentes no município de Muzambinho-MG, de ambos os sexos, matriculadas no ano de 2011 na rede privada (n=37) e na rede publica (n=78), pertencentes a faixa etária de 7 e 10 anos de idade. Foi determinado o Índice de Massa Corporal (IMC), o percentual de gordura (%G) através das dobras cutâneas tricipital e panturrilha (Fernandes Filho, 2003). A medida dos níveis de flexibilidade foi realizada através do protocolo de Sentar e Alcançar (WELLS; DILLON, 1952). Para a determinação do nível de atividade física e satisfação nas aulas de Educação Física foi aplicado o questionário “Dia Típico de Atividades Físicas e de Alimentação – DAFA” – modificado (BARROS; NAHAS, 2003). Ao final deste estudo pode-se observar que apesar de não existir diferenças significativas nos níveis de atividade física dos grupos estudados, as crianças na rede pública se mostraram mais satisfeitas com as aulas de Educação Física e as crianças da rede particular apresentaram-se valores superiores de IMC, %G e flexibilidade.

**PALAVRAS CHAVE**: aulas de Educação Física; atividade física; crianças.