# 82 - MOTOR DEVELOPMENT OF CHILDREN OBESE AND NON OBESE IN SCHOOL: A COMPARATIVE STUDY

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## INTRODUCTION

In the distant past, the society tended to attribute the status of healthy child to the fat child. Nowadays and based on the development of health science, this imagery has changed, thanks in part to systematicity of verification of body fat tends to be associated with health problems. In other words, today the fact is otherwise seen; overweight and childhood obesity have became indicative of problems.

According to Bouchard (2002), we find a vast number of publications associated with genetic and hereditary factors that determine that individual has a tendency to gain weight or not. Thus, if we mix genetics with poor eating modern habits like fast food, processed foods, snacks and other specifics we will get a framework for acceleration in childhood obesity. This all makes the old concept that a chubby child can become a strong and healthy child falls apart.

According to Fonseca (1995), "The main risks to obese children are elevations of triglycerides, cholesterol, orthopedic changes, blood pressure, skin and respiratory, and, in most cases these changes are more evident in adulthood."

All these problems associated with childhood obesity has somehow been focused under scientific perspective. Among the various methods and procedures used in this direction, stimulation of physical activity has received, perhaps, a greater clinical emphasis. Being this research, the view from the psychomotor learning and performance , a sense current and well accepted by teachers, doctors, psychologists and other professionals on the same area , is that kid out of standard obesity tends to have better motor performance and better adherence to physical activity.

This work is justified by the fact that much of the research is directed to methods and prevention of childhood obesity, and did not include motor development /psychomotor, thereby leaving a gap of questions about childhood obesity and possible interference in its development.

Considering, therefore, the importance of research in this direction, this study focuses specifically on this possible relationship. Therefore, the purpose of this study is to establish a comparison between obese and non-obese school children of 8 and 9 year old, using psychomotor tests in order to assess their motor skills.

### - Genetic and Metabolic Factors

Bee (1996), gave emphasis that genetic heritance interfere with biotype, stature, body shape. The trend is your children to follow the same appearance as parents, can bring a predisposition to being overweight and / or obesity.

Leung and Robson (1990) believe that apart from the excessive consumption of fat and low energy consumption, obesity may be related to the efficient metabolism (which does not consume calories to carry out daily tasks), or even the combination of the three factors. They note studies that relate to childhood obesity associated with early weaning to the introduction of baby's bottle and solid foods, which contain high concentrations of solutes that let the thirsty child, which is rewarded with more milk, thus becoming a vicious cycle of calories.

### - Behavioral Factor

The behavioral patterns affect eating habits, the amount of calories consumed each day, or in its activity and physical inactivity. It is known that the family lifestyle that leads the child may have a direct influence on your weight, or the environment in which children live is a trainer of behavioral and dietary habits, and that the child may be encouraged or not the practice of daily activities such as play, study and help out in home (Vidotto, 2008).

According Cyrino & Junior (1996), inactivity has being undoubtedly a major cause of increased body weight due to the imbalance in the energy balance, this is due to the intake greater than energy expenditure, causing as consequence the obesity.

### - Learning and Motor Development

For Le Boulch (1981), psychomotor education should be considered as a basic education in elementary school, starting point of all learning pre-school and school education and that the education by movement, has as main objective to contribute to the psychomotor development the child, which will influence your personality and school success.

In the same vein, Bueno (1998), says that the psychomotor education covers all the learning of the child proceeds through progressive steps and specific, as the overall development that each individual performs - in every moment of life, using perceptions experienced, with a direct intervention at the cognitive, motor and emotional structuring the individual as a whole. Education pass by the facilitation of natural conditions and prevention of disorders of the body.

### - Physical Education and Health

The school environment is ideal for clarification, elaboration of projects, programs to prevent obesity, encouraging physical activity. "The start of formal schooling is a major change in the child's physical development. The school means the beginning of the period in which it must learn all the kills and specific roles that are part of their culture. "(BEE, 1997).

### - Factors for the development

The human development involves continuous transformations that occur through the interaction of individuals within and between individuals and the environment in which they live. However, there are factors essential to human development, to be learned individually.

Fonseca (1995) presents the key factors in the human motor development, which are: the tone, balance, laterality, body concept, the space-time structure and praxis and sharp global. Thus establishing an inter-relationship of the signals and

their cohesion, the clinical significance of the signs lining now more relevant because it allows to analyze the structure of the factors and the composition of psychomotor processes more complex.

**METHODOLOGY**

We conducted a field study with 16 (sixteen) students, from Colégio Republicano with chronological age of 8 and 9 years with support from a literature review. At first the students were selected and separated into two groups, through a selection process done by measuring the circumference, using the protocol Penroe, Nelson and Fisher 1985; in order to define the group by its percentage of fat. The first group (group A) consisted of children with adequate fat percentage and the second group (group B) consisted of children with moderately high percentage of fat, high and too high, characterizing the population with obesity and overweight.

In the second moment made an applicatioin of psychomotor test in both groups, conducted through Victor Fonseca's psychomotor block (1995), direct observations from each student were conducted and students were tested through ten testing segments for development. The selection of students and research lasted two days (two different days of week). The location at which the assessments were carried out were on the court of the institution, destined for the day to day activities of these children. Studies of the data arising from the application of the block of tests were effected through descriptive and inferential statistics. Related to the portion to be descripted, the reference will be the mean and the inference, and the standard deviations of groups. The averages will be in tables, an analysis of this variation, called Kruskal Wallis will be performed on the data, aiming at with this, the identification of possible differences between the groups. It was stipulated the rate of alpha <or = 0.05.

**PRESENTATION AND DISCUSSION OF RESULTS**

According Filho (2003), citing Protocol Penroe, Nelson and Fisher (1985), were predicted to F% (fat percentage), using measures of some specific parts of the human body, where it is assumed that these measures have relationships positive, ie, it is assumed that when the corporate perimeter increase,% G levels also increase. For classification of the degree of F% was used in the following table:

With the above data we obtained the following results, presented in the tablesbelow:

TABLE 1: PERCENTAGE OF FAT T

Children and adolescents aged 7 to 17 years

| | Male | Female |
|---|---|---|
| Proper | 10.01% a 20% | 15.01% a 25% |
| Moderately high | 20.01% a 25% | 25.01% a 30% |
| High | 25.01% a 31% | 30.01% a 36% |
| Excessively high | greater than 31.01% | greater than 36.01% |

Fonte: Deurenberg et al. The assessment of the body fat percentage by skinfold thickness measurements in childhood e young adolescent. Bristish Journal of Nutrition, v. 63, n. 2, 1990.

With the above data we obtained the following results, presented in the tablesbelow:

TABLE 1: PERCENTAGE OF PROPER FAT VERIFIED IN CHILDREN IN GROUP A.

| Group 1 | Age | Height | Weight | Fist | Abdomen | Quadril | G% |
|---|---|---|---|---|---|---|---|
| Pupil 1 | 8 | 1,33 | 40 | 15 | 75 | | 15,45% |
| Pupil 2 | 9 | 1,36 | 35 | 15 | 64 | | 18,22% |
| Pupil 3 | 9 | 1,3 | 35 | 13 | 61 | | 12,27% |
| Pupil 4 | 8 | 1,35 | 45 | 17 | 78 | | 15,16% |
| Pupil 5 | 9 | 1,43 | 46 | 16 | 74 | | 14,90% |
| Pupil 6 | 9 | 1,38 | 50 | 18 | 80 | | 16,54% |
| Pupil 7 | 9 | 1,39 | 35 | | 60 | 75 | 17,25% |
| Pupil 8 | 8 | 1,35 | 40 | | 76 | 84 | 23,49% |

TABLE 2: PERCENTAGE OF FAT MODERATELY HIGH, HIGH, AND EXCESSIVELY HIGH VERIFIED IN GROUP B.

| Group 2 | Age | Height | Weight | Fist | Abdomen | Quadril | G% |
|---|---|---|---|---|---|---|---|
| Pupil 1 | 9 | 1,4 | 53 | 17 | 87 | | 26,34% |
| Pupil 2 | 8 | 1,35 | 50 | 19 | 87 | | 24,84% |
| Pupil 3 | 9 | 1,46 | 60 | 18 | 89 | | 24,60% |
| Pupil 4 | 8 | 1,37 | 50 | | 84 | 91 | 32,41% |
| Pupil 5 | 9 | 1,4 | 55 | | 83 | 96 | 37,00% |
| Pupil 6 | 9 | 1,43 | 55 | | 91 | 94 | 37,63% |
| Pupil 7 | 8 | 1,42 | 46 | | 85 | 83 | 27,91% |
| Pupil 8 | 9 | 1,46 | 65 | | 97 | 95 | 45,91% |

We chose to make only nine test psychomotor activities, where it was observed: tone of the upper limb, the tone of the lower limb, balance, lateral foot, hand dominance, time space, the body notion; global praxis, sharp praxis.notion;

The results were obtained by summing the values obtained for the evaluation of sub-factors. The value for each test varies between 1 and 4. Then each sum found was divided by the number of activities done so finding the average of each student. The value between 1 and 4 indicates the following situation: 4 - Achievements perfect controlled (excellent), 3 - Achievements appropriate controlled (good), 2 - Achievements difficulties with control (satisfactory); 1 - Accomplishments Imperfect,Incorrect and uncoordinated (bad).

TABLE 3: AVERAGE VALUES FOR BLOCKS AND INDIVIDUAL VALUES FOR PUPILS OF GROUP 1

| Group 1 | Pupil 1 | Pupil 2 | Pupil 3 | Pupil 4 | Pupil 5 | Pupil 6 | Pupil 7 | Pupil 8 |
|---|---|---|---|---|---|---|---|---|
| Tone. (l.l.) | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 |
| Tone.(u.l.) | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 |
| Equilibrium | 3 | 3 | 3 | 1 | 2 | 4 | 3 | 4 |
| **Average bl1** | **2,66** | **3** | **2,66** | **1,66** | **2,33** | **3** | **3** | **2,66** |
| Body notion | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 2 |
| Organization | 3 | 1 | 2 | 2 | 2 | 3 | 3 | 2 |
| Manual lat. | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 |
| Pedal lat. | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 |
| **Average bl2** | **3,25** | **2,75** | **2,5** | **2,75** | **3,25** | **3** | **3,5** | **3** |
| Global práxis | 1 | 1 | 4 | 3 | 2 | 4 | 4 | 2 |
| Sharp praxis | 1 | 1 | 4 | 3 | 2 | 4 | 4 | 3 |
| **Average bl3** | **1** | **1** | **4** | **3** | **2** | **2** | **2** | **2,5** |
| **Total average** | **2,555556** | **2,444444** | **2,888889** | **2,444444** | **2,666667** | **3,222222** | **3,444444** | **2,777778** |

TABLE 4: AVERAGE VALUES FOR BLOCKS AND INDIVIDUAL VALUES FOR PUPILS OF GROUP 2

| Group 2 | Pupil 1 | Pupil 2 | Pupil 3 | Pupil 4 | Pupil 5 | Pupil 6 | Pupil 7 | Pupil 8 |
|---|---|---|---|---|---|---|---|---|
| Tonic. (m.i) | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 3 |
| Tonic.(m.s) | 3 | 2 | 4 | 3 | 2 | 4 | 3 | 3 |
| Equilíbrio | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 |
| **Average bl1** | **3** | **2,33** | **3,66** | **3,33** | **2,66** | **3,33** | **3** | **3** |
| Body notion | 3 | 3 | 4 | 3 | 1 | 4 | 3 | 4 |
| Organization | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 3 |
| Manual lat. | 4 | 4 | 1 | 4 | 3 | 4 | 4 | 4 |
| Pedal lat. | 4 | 4 | 1 | 4 | 3 | 4 | 4 | 4 |
| **Average bl2** | **3,5** | **3,25** | **2,25** | **3,25** | **2,25** | **3,75** | **3,5** | **3,25** |
| Global práxis | 3 | 3 | 2 | 4 | 1 | 3 | 1 | 4 |
| Sharp práxis | 4 | 2 | 2 | 2 | 4 | 2 | 1 | 3 |
| **Average bl3** | **3,5** | **2,5** | **2** | **3** | **2,5** | **2,5** | **1** | **2,5** |
| **Total averagel** | **3,333333** | **2,777778** | **2,666667** | **3,222222** | **2,444444** | **3,333333** | **2,555556** | **3,444444** |

TABLE 5: AVERAGE OF GROUP 1 IN RELATION TO APPLIED ACTIVITIES

| Group 1 | |
|---|---|
| **Block 1** | **Média** |
| Tone | 2,625 |
| Toniciity (upper limb) | 2,375 |
| Equilibrium | 2,875 |
| **Block 2** | |
| Lateralization (manual and pedal) | 3,75 |
| Body Notion | 3,125 |
| Space time organization | 3,375 |
| **Block 3** | |
| Sharp praxis | 2,5 |
| Global praxisl | 2,625 |

TABLE 6: AVERAGE FROM GROUP 2 IN RELATION TO 2 BLOCKS OF APPLIED ACTIVITIES

| Group 2 s | |
|---|---|
| Block 1 | Average |
| Tone (lower limb) | 2,625 |
| Tone (upper limb) | 3 |
| Equilibrium | 3,5 |
| Block 2 | |
| Lateralization(manual and pedal) | 3,5 |
| Body notion | 3,125 |
| Space time organization | 2,375 |
| Block 3 | 2,5 |
| Sharp práxis | |
| Global praxis | 2,625 |

With regard to items Tone and Balance, a group of children with adequate fat percentage (lean) proved to be less efficient, not the case in relation to the block 3, which tested fine Praxis and global situation they were higher than children above the appropriate percentage of fat (obese or overweight) in terms of performance. In block 2, the groups were about equal.

Observing from the overall average, the picture changes dramatically, in which the averages are distributed, revealing a “type” of equality between groups. As the group (obese and overweight), with a slight advantage over the group 1 (children underweight).

Using the averages of individual scores is seen by both groups, a diversity of outcomes for individuals with regard to tone and balance. Revealing individual performance with respectto each proposed activity applied by the battery.

Since many of the students in group 2, reveal advantages with respect to theirstudents in group 1, seven students from both groups had students draw and asecond group, which in relation to two students in Group 2 and obtain advantage performance in tone and balance.

The above data when studied through statistical inference, through theinstrumentcalled non-parametric Kruskal Wallis test, showed no statistical significance incomparisons between groups by blocks.

This analysis indicated a value of $p < 0.05$ compared to all blocks. Although, as discussed above, the group of obese children have shown - is far more effective in blocks 1 and 2, and the group of non-obese children more effective in block 3. The tests are shown in table 2:

TABELA 2: TEST RESULTS OF ANALYSIS OF VARIANCE KRUSKAL-WALLIS, ON DATA BLOCKS BETWEEN GROUPS FOR TESTING

| ETO | BLOCK 1 | BLOCK 2 | BLOCK 3 |
|---|---|---|---|
| Chi ² | 3,226 | 0,930 | 0,139 |
| Gl | 1 | 1 | 1 |
| Significance | 0,072 | 0,335 | 0,709 |

Significance block 1 - 0,072 > 0,05

Significance block 2 – 0,335 > 0,05

Significance block 3 – 0,709 > 0,05

**FINAL CONCLUSIONS AND RECOMMENDATIONS**

According to field research, it was observed through analysis of data collected by a psychomotor test no significant difference between the two groups. Children with excess body fat had the same difficulties as other children, lying on the same level of psychomotor development. Which leads us to conclude that childhood obesity is not interference factor in child development.

Through literature we can observe that few authors established the relationship between obesity and psychomotor development. However, it was shown that psychomotor learning is unique to each individual, ie, it is developed according to individual body experiences and unique to each human being, that learning occurs regardless of the factor excess body fat.

Is importantly emphasis, that the tests applied were focused on psychomotor skills and learning, but was not tested the aerobic capacity of children between the groups, since the activities had little movement.

However, considering the possible relevance of this study, whose intention was not exhausted this subject, it is recommend to other interested parties, conduct a study that be broader and more detailed, with a greater number of individuals so that the result be more reliable owever, considering the possible relevance of this study, whose intention was not exhausted this subject, it is recommended to other interested parties, conducted a study that is broader and more detailed, with a greater number of individuals so that the result is more reliable

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**MOTOR DEVELOPMENT OF CHILDREN OBESE AND NON OBESE IN SCHOOL: A COMPARATIVE STUDY**

**ABSTRACT:**

The present study deals with the prevention of childhood obesity and promoting health at school. Among the various methods and procedures used in this direction, stimulation of physical activity has received, perhaps, a greater emphasis among professionals who work in this area. It is believed that the child outside the standard of obesity tends to have better motor performance and better adherence to physical activity. The objective of this study is to establish a comparison between school children obese and nonobese, using psychomotor tests in order to assess their motor skills. We conducted a field study with 16 (sixteen) students, the Colégio Republicano, with chronological age of 8 and 9 years with the support of literature review. Through

the analysis of data collected by psychomotor tests revealed a non significant difference between the two groups. Children with excess body fat had the same difficulties as other children, lying on the same level of psychomotor development, which leads us to conclude that childhood obesity is not interference factor in child development.

**KEYWORDS:** psychomotor development, Childhood Obesity, Health in school

**DÉVELOPPEMENT MOTEUR DES ÉLÈVES DES ÉCOLES OBÈSES ET NON OBÈSES: UNE ÉTUDE COMPARATIVE**

**RESUMÉ:**

La presente étude traite de la prévention de l'obésité infantile et promouvoir la santéà l'école. Parmi les diverses méthodes et procedures utilisées dans cette direction, la stimulation de l'activité physique a reçu, peut-être, une plus grande importance par miles professionnels qui travaillent dans ce domaine. On croit que l'enfant endehors de la norme de l'obésité a tendance à avoir um meilleur rendement dumoteur et une meilleure adhérence à l'activité physique. L'objectif de cette étude est d'établir une comparaison entre les enfants obèses et non obèses scolaires, en utilisant dês tests psychomoteurs afin d'évaluer leurs compétences. Nous avons mené une étude sur le terrain avec 16 (seize), lês étudiants, le collège républicain avec l'âge chronologique des 8 et 9 ans avec lês outien d'une revue de la littérature. Grâce à l'analyse dês données recueillies par lês tests psychomoteurs ont révélé une différence non significative entre lês deux groupes. Les enfants atteints excès de graisse corporelle ont lês mêmes difficultés que lês autres enfants, couché sur Le même niveau de développement psychomoteur, qui nous amène à conclure que l'obésité infantile n'est pas facteur perturbateur dans le développement des enfants.

**MOTS-CLÉS:** développement psychomoteur, l'obésité infantile, La santé à l'école

**MOTOR DE DESARROLLO DE LA ESCUELA ESTUDIANTES OBESOS Y NO OBESOS: ESTUDIO COMPARATIVO**

**RESUMEN:**

El presente estudio trata de la prevención de la obesidad infantil y promover la salud en la escuela. Entre los diversos métodos y procedimientos utilizados en esta dirección, el estímulo de la actividad física ha recibido, tal vez, un mayor énfasis entre los profesionales que trabajan en esta área. Se cree que el niño fuera del estándar de la obesidad tiende a tener un mejor rendimiento motor y una mejor adherencia a la actividad física. El objetivo de este estudio es establecer una comparación entre los escolares obesos y no obesos, con pruebas psicomotoras con el fin de evaluar sus habilidades motoras. Se realizó un estudio de campo con 16 (dieciséis) estudiantes, del Colégio Republicano con la edad cronológica de 8 y 9 años con el apoyo de una revisión de la literatura. A través del análisis de los datos recogidos por las pruebas psicomotoras no reveló una diferencia significativa entre los dos grupos. Los niños con exceso de grasa corporal tenían las mismas dificultades que otros niños, situada en el mismo nivel de desarrollo psicomotor, lo que nos lleva a concluir que la obesidad infantil no es un factor de interferencia en el desarrollo del niño.

**PALABRAS CLAVE:** desarrollo psicomotor, la obesidad infantil, la salud en la escuela

**DESENVOLVIMENTO MOTOR DE ALUNOS OBESOS E NÃO OBESOS NA ESCOLA: UM ESTUDO COMPARATIVO**

**RESUMO:**

O presente estudo trata da prevenção da obesidade infantil e da promoção de saúde na escola. Dentre os vários métodos e procedimentos utilizados nesta direção, a estimulação da prática da atividade física tem recebido, talvez, um maior destaque entre os profissionais que atuam nesta área. Acredita-se que a criança fora do padrão de obesidade tende a ter uma melhor performance motora e uma melhor aderência a prática de atividades físicas. O objetivo deste estudo é estabelecer uma comparação entre crianças em idade escolar obesas e não obesas, através de testes psicomotores, afim de avaliar suas habilidades motrizes. Foi realizada uma pesquisa de campo com 16 (dezesseis) alunos, do Colégio Republicano com idade cronológica de 8 e 9 anos com o apoio de uma revisão bibliográfica. Através da analise dos dados coletados pelo testes psicomotores observou-se uma diferenciação não significativa entre os dois grupos. As crianças com excesso de gordura corporal apresentaram as mesmas dificuldades que as demais crianças, encontrando-se no mesmo patamar de desenvolvimento psicomotor, o que nos leva a concluir que a obesidade infantil não é fator de interferência no desenvolvimento da criança.

**PALAVRAS CHAVE:** Desenvolvimento psicomotor; Obesidade infantil; Saúde na escola