# 22 - PREVALENCE OF OVERWEIGHT AND OBESITY AND LEVEL OF PHYSICAL ACTIVITY IN ADOLESCENTS ATTENDING GRADE SCHOOL OR HIGH SCHOOL IN PUBLIC EDUCATIONAL INSTITUTES IN LAPA PR MUNICIPAL RURAL DISTRICT.

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## INTRODUCTION

In Brazil, the overweight and obesity indexes are alarming. In a population of 95.5 million people of the age of 20 or more, there are 38.8 million (40.6%) of them with excessive weight, and 10.5 million of them are considered obese (IBGE, 2004). The excess of body fat is associated with several health problems, including hypertension, heart diseases and diabetes (NAHAS, 2003).

The sedentarism is also a significant factor in obesity because the obesity growth among youngsters in conjunction with the decrease of physical education programs in schools shows an alarming tendency in the whole world (MINISTÉRIO DA SAÚDE, 2002). Obese children and adolescents tend to turn into obese adults and in agreement with Mossberg (1989) apud Fernandéz et al. (2004), 80% of the obese adolescents remain obese in the adult phase.

The physical inactivity associated to inadequate diets, to smoking, to alcohol and other drugs leads to the occurrence and progression of not transmissible chronic diseases, especially hypertension and diabetes. Every year, more than two million people die all over the world due to health problems attributed to the sedentarism (CDC, 2000). In Brazil, chronic-degenerative diseases have been the first morbidity and death cause in the adult population, surpassing by far other types of diseases (GUEDES & GUEDES, 1995).

Studies of overweight and obesity prevalence, of physical activity levels and of other health risky behaviors are highly relevant considering the need of established epidemic prevention policies, focusing on many behaviors (as inactivity and obesity) that lead to health risks and not only on the effects. (morbidity and death) (BARROS, 2000 apud BENEDETTI et al., 2004).

Physical activity brings many benefits to health during childhood and adolescence, including a proper development of the skeleton and a prevention of obesity, besides contributing positively to the cardio vascular system and reducing the risk factors in adults. (CASPERSEN et al., 1998 apud WESTERSTAHL, 2005; STEINBECK, 2001). Therefore it is advisable that adolescents exercise moderately for at least 30 to 60 minutes daily. (SALLIS & PATRICK, 1994; BIDDLE et al., 1998 apud WESTERSTAHL, 2005).

Considering all the above aspects, the objective of this study is to verify the overweight and obesity prevalence and the levels of the physical activity is the adolescents attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district.

## MATERIALS AND METHODS

This study was accomplished with students attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district, whose sample was obtained through the data bank of a research project, started in June 2005, named “Quality of Life Analysis, Alcoholism Prevalence, Physical Activity Level and Body Mass Indexes in students attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district.

The referred project is a broader study whose subjects were 1,719 students attending Grade School 1st, 2nd and 3rd. year in Lapa-PR municipal district. The Schools comprised of schools, being 2 of them being private and 5 of them being public. The public schools were such as 3 in the rural district and 2 in the city area. The variables were observed under a study of a transversal cut.

The protocols of intervention in the study were submitted to the Ethic in Research Committee of the State University of Ponta Grossa city and have followed the guidance of 196/96 of the Health National Counsel Resolution about research involving the human being.

This study involved a diversified population as a base, and the subjects of the initial group representing the schools in rural districts were composed of 388 adolescents. However, only 196 of them showed interest in participating in the research were present at the day scheduled for the data collection and handed back the Free and Consensual Consent Term containing their parents' consent, if the student was under eighteen. The students above 18 signed their own Consent Form.

The age limit was set up according to the Heath World Organization criterion which states that the stage of adolescence is limited to the period of life between 10 and 20. (ZEFERINO et al., 2003). From this sample, 3 students over 20 were excluded, a female and two males. The final sample comprised of 193 adolescents (50,5% of the initial group), 101 males and 92 females. (Table 1)

**Tabela 1** Characterization of the sample of adolescents attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district according to the age group and gender.

| Age group | Male sex | Female sex | Total |
|---|---|---|---|
| **14-15** | 44 | 50 | 94 |
| **16-17** | 41 | 36 | 77 |
| **18-20** | 16 | 06 | 22 |
| ***Total*** | 101 | 92 | 193 |

To verify overweight and obesity prevalence, the Body Mass Index (BMI) was used based in the proposed categorization by Centers for Disease Control and Prevention (CDC), being adjusted in percentage for sex and age starting from 2 to 20 years of age (KUCZMARSKI et al., 2000). BMI determines if a person's corporal mass is within the limits recommended for good health dividing the body mass (Kg) by height (meters) square.

The adolescents' body mass was obtained through a digital scale “Plenna”, with accuracy of 100g. The adolescents were weighed standing up, barefoot or in socks and dressed with minimum clothes.

The height was verified with a measuring tape whose accuracy is 0.1cm, fastened in a flat surface. In order to assess the correct height, the participant should stand up barefoot or in socks, in breathing apnea and with the head positioned according to the Frankfurt plan, forming an angle of 90 degrees in relation to the floor (LOHMAN et al., 1988).

The level of physical activity was measured with the help of the International Physical Activities Questionnaire of (IPAQ version 8, short form, last week), developed by the World Organization of Health, Center of Control and Prevention of Diseases of the United States and Karolinska Institute in Sweden, and validated in Brazil by the Center of Studies of the Laboratory of Physical fitness of São Caetano do Sul city (CELAFISCS). This instrument contains 4 questions that assess the participant's performance in moderate and vigorous physical activities during the last week (MATSUDO et al., 2001).

To analyze the level of physical activity, the agreed consensus between CELAFISCS and the Center for Disease Control (CDC) of Atlanta in 2002 was used, considering the frequency and duration criteria, which classifies people in five categories: sedentary, insufficiently active A, insufficiently active B, active and very active (MATSUDO et al., 2002).

At first the qui-square was used to verify the possible associations between the levels of physical activity and the body mass index of the adolescents analyzed by gender and total sample. However, no significant association was observed. So, the descriptive analysis through the percentile frequencies of the indicators was used in order to verify the sample behavior in relation to overweight and obesity prevalence and levels of physical activity.

**RESULTS**

Overweight and obesity indexes separated by gender, according to the classification proposed by CDC are shown in Table 2. A total overweight of 8.9% in males and 8.7% in females were found. Coincidentally the indexes for obesity and low weight were identical for both sexes (only 1.0% in boys and 2.2% in girls). Most of the assessed adolescents (89.1% male and 86.9% female) were classified as being according to the standard pattern, regarding body mass index, which was very similar between the two sexes.

The results regarding the levels of physical activity of the adolescents, differentiated in gender, can be observed in Table 3. No adolescent was classified as sedentary. In the categories insufficiently active B and insufficiently active A, the findings indicated respectively 1.0% and 2.0% for males, and 0% and 2.2% for females. Most of the adolescents of both sexes were classified as active and/or very active, being active 33.6% of the boys and 54.3% of the girls, and very active 63.4% of the boys and 43.5%, and girls.

**Table 2** Classification of the BMI of adolescents attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district, differentiated by sex.

| BMI Classification | M % (n=101) | F % (n=92) |
|---|---|---|
| **Light weight** | 1.0 | 2.2 |
| **Normal** | 89.1 | 86.9 |
| **Overweight** | 8.9 | 8.7 |
| ***Obesity*** | 1.0 | 2.2 |

**Table 3** Classification of physical activity levels of adolescents attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district, differentiated by sex.

| Physical Activity Level | M % (n=101) | F % (n=92) |
|---|---|---|
| **Sedentary** | 0 | 0 |
| **Insufficiently Active B** | 1.0 | 0 |
| **Insufficiently Active A** | 2.0 | 2.2 |
| **Active** | 33.6 | 54.3 |
| ***Very Active*** | 63.4 | 43.5 |

**DISCUSSION**

Overweight and obesity in childhood and adolescence are increasing alarmingly all over the world, and that has been considered a great problem in public health which tends to get worse hereafter. Nationally representative data from the National Health and Nutrition Examination Survey (NHANES) show that overweight prevalence (BMI > percentile 85) among children and adolescents from 6 to 19, in the USA, has been increasing more than the double since 1970. The overweight prevalence rate boosted from 15% in 1971-1994 to 26% in 1988-1994 and to 30% in 1999-2000, and obesity prevalence (BMI > percentile 95) had an increase of approximately four times, from 4% to 15% (WANG, 2004; ST-ONGE et al., 2003).

A study carried out in Florianópolis with scholars aged from 15 to 18 found 12% of the adolescents with an overweight profile (FARIAS JÚNIOR & LOPES, 2003). In a research accomplished on data from four countries (Brazil, 1975 and 1997; United States, 1971-1974 and 1988-1994; China, 1991 and 1997 and Russia, 1992 and 1998) overweight prevalence increased in 3 of the 4 countries in the study period, increasing in four times in Brazil, almost duplicating in the USA and presenting an increase of 1. 5 in China. In contrast, overweight prevalence in Russia had a decrease from 15.6% to 9%, due to an economical shock and a great reduction in the typical energetic intake in that country. The increase in overweight prevalence of adolescents aged from 10 to 18 in Brazil was from 3.7% in 1974 to 12.6% in 1997 (WANG et al., 2002).

Our results demonstrated low overweight and obesity indexes, if compared with other studies. The analyzed sample refers to adolescent students from rural schools, and that aspect could the reason for the low indexes obtained. Wang et al. (2002) also observed that overweight prevalence in Brazil was much larger in urban areas than in rural areas.

The comparison among Brazilian studies on overweight/obesity in children and adolescents is hindered due to great cultural and socioeconomic differences observed in different areas, mainly concerning to the great variety of methods used to classify overweight and/or obesity occurring in the period of the life under observation.

The level of physical activity verified in the study suggests that adolescents are engaged to physical activities practices. It can also be observed, that the majority of the adolescents, boys as well as girls, are active, and that most of them are classified as active. In a study carried out by Guedes et al. (2001), with adolescents aged from 18 and 28, in Londrina-PR, it was observed that the adolescents' proportion classified as inactive or very inactive was of 65% among girls and of 46% among boys. In Florianópolis city, Farias Júnior & Lopes (2004), found that 65.7% of the adolescents aged from 15-18 presented insufficient levels of physical activity, and these levels were higher among girls than boys, 78.3% and 52.1%, respectively.

Despite the differences observed in relation to methodological procedures (measure instruments and criteria to classify the level of physical activity practice) adopted to evaluate the level of physical activity in children and adolescents, it is necessary to consider that our results have not found any adolescent as sedentary and most of them were classified as active and/or very active, differing from the results mentioned above.

It must also be taken into account that the adolescents studied in the mentioned researches are residents of urban areas, and maybe that is why the physical activity levels of our population were higher, because, although mechanization has reduced the energy expenditure in farming, nevertheless the caloric expense can be considered well higher in rural activities than in urban ones, where the greatest number of work activities are classified as sedentary (GLANER, 2002).

Another important aspect that should be highlighted is the fact that the levels of physical activity were almost the same (see Table 3) between the sexes in this study, corroborating the results regarding higher activity level and the differences found in this study to the mentioned ones.

The results give us support with data to state that the high physical activity levels of these adolescents can probably be associated to the low overweight and obesity indexes. Studies demonstrate that obese youths present smaller level of physical activity since early age, showing that hypo activity possibly precedes fat accumulation (GUEDES & GUEDES, 2003). Physical inactivity is the most important factor that explains the amazing frequency of excessive weight found in modern western societies (POLLOCK & WILMORE, 1993).

Another phenomenon frequently observed in the last decades is that adolescents have been substituting regular meals for snacks and fast food in circumstances where the lack of the parents' care has been increasing (SABIN, 2004). Due to the low overweight and obesity index found in this study, we can state that those adolescents probably have healthy and regular alimentary habits, as meals at home and traditional alimentary consumption, routine frequently noticed in rural areas, opposite to the urbanization process where the changes in the place of having meals, and the hurry of the day by day favors fast meals accompanied with fat and fries.

These factors, modifying the alimentary habits, end up influencing the population lifestyle and health. (GARCIA, 2003;

ABREU et al., 2001).

Sichieri (2003) assessed, for the population of Rio de Janeiro, patterns of alimentary consumption obtained by the methodology of main components and showed that a pattern of traditional alimentary consumption, based on rice and bean has prevented the presence of overweight and obesity.

Positive attitudes in relation to the practice of regular physical activity can be influenced by a better knowledge on the benefits, principles and practices of the physical activity, and vice-versa. The physical activity should always be related to a healthy diet, observing the quantitative (number of intake calories) and qualitative (meals composition) aspect (NAHAS, 2003).

The evidence of a prevalence of individuals with overweight and obesity gives us supporting data that corroborate the importance of health education programs that would integrate guided practice of physical activity and the need of setting up healthy alimentary habits, as preventive measures (MARTINS et al., 2001).

**CONCLUSION**

Taking into account the limitations of the present study, we can conclude that overweight and obesity prevalence in students attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district was low, possibly because the great majority of the adolescents presented active and/or very active levels of physical activity.

Epidemic studies regarding overweight and obesity prevalence and physical activity levels are of extreme importance and urgency, considering the physical activity practice decrease and the overweight and obesity indexes increase in several populations.

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**PREVALENCE OF OVERWEIGHT AND OBESITY AND LEVEL OF PHYSICAL ACTIVITY IN ADOLESCENTS ATTENDING GRADE SCHOOL OR HIGH SCHOOL IN PUBLIC EDUCATIONAL INSTITUTES IN LAPA PR MUNICIPAL RURAL DISTRICT.**

**Summary**

Overweight and sedentarism indexes in children and adolescents have been constantly increasing in the past few decades. Considering these aspects, the objective of this study is to verify the overweight and obesity prevalence and the physical activity levels in students attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district. The subjects being studied were 193 students, 101 males and 92 females, attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district. The Body Mass Index (BMI), based on the classification proposed by CDC, was used to verify the overweight and obesity prevalence. The level of physical activity was measured through IPAQ. At first the qui-square analysis was used to verify the probable associations between the levels of physical activity and the adolescents' body mass index by sex and total sample. However, no significant association was observed. Thus, the descriptive analysis through the percentile frequencies of the indicators was used to verify the behavior of the sample in relation to overweight and obesity prevalence and physical activity levels. The results showed a total overweight of 8.9% in males and 8.7% in females, respectively. Coincidentally the indexes for obesity and low weight were identical for both sexes (only 1.0% in males and 2.2% in females, respectively). Most of the adolescents were classified as active and/or very active, being 33.6% of active boys and 54.3% of active girls, and 63.4% in very active boys and 43.5% in very active girls. It can be concluded that overweight and obesity prevalence was low among the students attending grade school or high school in Public Educational Institutes in Lapa-PR municipal rural district, possibly because the great majority of the adolescents presented active or very active levels of physical activity.

Word-key: BMI, Activity Level Physical, Adolescents.

**PREVALENCE DE SURCHARGE ET OBESITÉ ET NIVEAU D'ACTIVITÉ PHYSIQUE DANS LES ADOLESCENTS DU RÉSEAU PUBLIQUE RURAL D'ENSEIGNEMENT MOYEN DU MUNICIPALITÉ DE LA LAPA-PR**

**Résumé**

Les indices de surcharge et sédentarisme sont augmentant continuelement aux enfants et aux adolescents dans les derniers décades. On pensant dans ces facteurs, l'objetif de cet étude est vérifier la prevalence de surcharge et obesité et les niveaux d'activité physique dans les adolescents étudiants du réseau publique rural d'enseignement moyen du municipalité de la Lapa-Pr. Cet étude a été realisé avec 193 étudiants du réseau publique rural d'enseignement moyen du municipalité de la Lapa-Pr, en étant 101 du sexo masculin et 92 du sexe féminin. Pour la constatation de la prevalence de surcharge et obesité on a utilisé l'Indice de Masse Corporel (IMC) sur la base dans la classsification proposé pour le CDC. Le niveau de l'activité physique a été mensuré à travers de l 'IPAQ. Dans un premier moment on a recourru l'analyse du carré pour vérifier les possibles associations entre les niveaux d'activité physique et l'indice de masse corporel des adolescents étudiés par sexe et l'échantillon total, toute fois on n'a pas observé l'association éminante. De cette forme on a recourru l'analyse descriptive à travers des freqüences pourcentuels des indicateurs utilisés pour vérifier le comportement de l'échantillon par rapport à la prevalence de sucharge et obesité et niveaux d'activité physique. Sur base dans les résultats on a obtenu un total de 8,9% et 8,7% de surcharge pour le sexe masculin et féminin, respectif. En coincidence les indices pour l'obesité et bas poids ont été indêntiques pour tous les deux sexes (à peine 1,0% et 2,2% pour les garçons et les filles respectif). La plupart des adolescents a été classé comme actif et/ou très actifs, en étant 33,6% des garçons actifs et 54,3% des filles actives, et 63,4% et 43,5%, des garçons et des filles très actifs, respectif. On peut conclure que la prevalence de surcharge et obesité des étudiants du réseau publique rural d'enseignement du municipalité de la Lapa-Pr a été bas, probablement parce que la grande plupart des adolescents a presenté des niveaux d'activité physique actif et/ou très actif.

Paroles-clef: IMC, Niveau D'activité Physique, Adolescents.

**PREVALENCIA DE SOBREPESO Y OBESIDAD Y NIVEL DE ACTIVIDAD FÍSICA EN ADOLESCENTES DE LA RED PÚBLICA RURAL DEL BACHILLERATO DEL MUNICIPIO LAPA-PR**

**Resumen**

Los índices de sobrepeso y sedentarismo están aumentando constantemente en niños y adolescentes en las últimas décadas. Pensándose en estos factores el objetivo de este estudio es verificar la prevalencia de sobrepeso y obesidad y los niveles de actividad física en adolescentes estudiantes de la red pública rural del bachillerato del municipio Lapa-PR. Este estudio fue realizado con 193 estudiantes de la red pública rural del bachillerato del municipio Lapa-Pr, siendo 101 del sexo masculino y 92 del sexo femenino. Para verificación de la prevalencia de sobrepeso y obesidad se utilizó el Índice de Masa Corporal (IMC), con base en la clasificación propuesta por el CDC. El nivel de actividad física fue medido a través del IPAQ. En un primer momento se recurrió el análisis del qui-cuadrado para verificar las posibles asociaciones entre los niveles de actividad física y el índice de masa corporal de los adolescentes estudiados por sexo y muestra total, sin embargo no se observó asociación significante. De esta forma, se recurrió el análisis descriptivo a través de las frecuencias porcentuales de los indicadores utilizados para verificar el comportamiento de la muestra en relación a la prevalencia de sobrepeso y obesidad y niveles de actividad física. Con base en los resultados se obtuvo un total del 8.9% y un 8.7% de sobrepeso para el sexo masculino y femenino, respectivamente. Coincidentemente los índices para obesidad y bajo peso fueron idénticos para ambos sexos (sólo un 1.0% y un 2.2% para los niños y niñas, respectivamente). La mayoría de los adolescentes fue clasificada como activos y/o muy activos, siendo un 33.6% de los niños activos y un 54.3% de las niñas activas, y un 63.4% y un 43.5%, de los niños y niñas muy activos, respectivamente. Se puede concluir que la prevalencia de sobrepeso y obesidad de los estudiantes de la red pública rural del bachillerato del municipio de Lapa-Pr fue baja, posiblemente porque la gran mayoría de los adolescentes presentó niveles de actividad física activo y/o muy activo.

Palavras-chave: IMC, Nível de Atividade Física, Adolescentes.

**PREVALÊNCIA DE SOBREPESO E OBESIDADE E NÍVEL DE ATIVIDADE FÍSICA EM ADOLESCENTES DA REDE PÚBLICA RURAL DO ENSINO MÉDIO DO MUNICÍPIO DA LAPA- PR**

**Resumo**

Os índices de sobrepeso e sedentarismo estão aumentando constantemente em crianças e adolescentes nas últimas décadas. Pensando-se nestes fatores o objetivo deste estudo é verificar a prevalência de sobrepeso e obesidade e os níveis de atividade física em adolescentes estudantes da rede pública rural do ensino médio do município da Lapa-PR. Este estudo foi realizado com 193 estudantes da rede pública rural do ensino médio do município da Lapa-Pr, sendo 101 do sexo masculino e 92 do sexo feminino. Para verificação da prevalência de sobrepeso e obesidade utilizou-se o Índice de Massa Corporal (IMC), com base na classificação proposta pelo CDC. O nível de atividade física foi mensurado através do IPAQ. Em um primeiro momento recorreu-se a análise do qui-quadrado para verificar as possíveis associações entre os níveis de atividade física e o índice de massa corporal dos adolescentes estudados por sexo e amostra total, porém não se observou associação significante. Desta forma, recorreu-se a análise descritiva através das freqüências percentuais dos indicadores utilizados para verificar o comportamento da amostra em relação à prevalência de sobrepeso e obesidade e níveis de atividade física. Com base nos resultados obteve-se um total de 8.9% e 8.7% de sobrepeso para o sexo masculino e feminino, respectivamente. Coincidentemente os índices para obesidade e baixo peso foram idênticos para ambos os sexos (apenas 1.0% e 2.2% para os meninos e meninas, respectivamente). A maioria dos adolescentes foi classificada como ativos e/ou muito ativos, sendo 33.6% dos meninos ativos e 54.3% das meninas ativas, e 63.4% e 43.5%, dos meninos e meninas muito ativos, respectivamente. Pode-se concluir que a prevalência de sobrepeso e obesidade dos estudantes da rede pública rural do ensino médio do município da Lapa-Pr foi baixa, possivelmente porque a grande maioria dos adolescentes apresentou níveis de atividade física ativo e/ou muito ativo.

Palavras-chave: IMC, Nível de Atividade Física, Adolescentes.