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ORIGINAL

PHYSICAL ACTIVITY, NUTRITIONAL STATUS AND ABDOMINAL OBESITY AMONGST PHYSICAL EDUCATION TEACHERS

ACTIVIDAD FÍSICA, ESTADO NUTRICIONAL Y OBESIDAD ABDOMINAL EN PROFESORES DEL ÁREA DE LA CULTURA FÍSICA

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ABSTRACT

The purpose of this study was to estimate the prevalence of the level of physical activity, nutritional status and abdominal obesity among Physical Education teachers in Mexicali Baja California. 79 teachers from 43.4 ± 9.8 years of age were studied, in order to classify the level of physical activity the International Physical Activity Questionnaire (IPAQ) was administered, to determine the body mass index and abdominal obesity, anthropometric measurements were taken (weight, height and waist circumference).

Results showed a high level of physical activity for 46.8%, moderate 27.8% and low 25.3%. The prevalence of combined overweight and obesity using BMI was 82.3% and the prevalence of abdominal obesity was 43.5% in males and 29.4% in females. The findings of this study showed a high combined prevalence of high and moderate levels of physical activity in these subjects but also a high prevalence of overweight and obesity, even higher than the Mexican national average.

Key words: Physical activity, Nutritional status, Abdominal obesity.

RESUMEN

El propósito de este trabajo fue estimar la prevalencia del nivel de actividad física, estado nutricional y obesidad abdominal en profesores del área de la cultura física de la ciudad de Mexicali, Baja California. Fueron estudiados 79 sujetos de 43.4 ± 9.8 años de edad, para clasificar el nivel de actividad física se aplicó el cuestionario internacional de actividad física (IPAQ), para determinar el índice de masa corporal y obesidad abdominal se tomaron medidas antropométricas (peso, talla y circunferencia de cintura). Resultando con un nivel de actividad física alta de 46.8%, moderada 27.8% y baja 25.3%. La prevalencia combinada de sobrepeso y obesidad con el IMC fue de 82.3% y la prevalencia de obesidad abdominal fue de 43.5% y 29.4% en hombres y mujeres respectivamente. Mostrando sujetos con altas prevalencias combinadas de nivel de actividad física alta y moderada, y altas prevalencias combinadas de sobrepeso y obesidad, incluso mayores que los porcentajes promedio de México.

Palabras clave: Actividad física, Estado nutricional, Obesidad abdominal.

INTRODUCTION

In 1997 the World Health Organization (WHO) showed that overweight and obesity affect more than half of the population of many nations, suggesting that this problem needs to be addressed in order to prevent the rise of chronic non communicable diseases. According to data released by the Pan American Health Organization, chronic diseases were the cause of 60% of the deaths worldwide, a percentage that will rise to 73% by the year 2020. Modern societies, most of which are urban, seem to converge towards the consumption of food with a high energy content, high in fat and carbohydrates and low in fiber, while also being associated with an increasingly sedentary lifestyle. These changes magnify the problems resulting from the epidemiological transition and cause the age that nutrition related chronic diseases appear to be increasingly younger and among groups with lower incomes. (Lynch et al. 1996; Lang & Ducimetiere, 1995).

Sedentary lifestyle habits constitute one of the biggest risk factors and explain the current epidemic proportions of non communicable diseases. These sedentary habits are perhaps due to the increasing crime rates in urban areas, which inhibit their habitants from carrying out activities such as walking, running or cycling, this added to the lack of suitable locations in which to carry out sporting activities. A sedentary lifestyle represents much more than physical inactivity and is generally associated with habits that involve the increase in consumption of foods with a high energy content. The correlation between hours in front of the television and an increase in consumption of high energy foods has been shown in all ethereal groups. Sedentary lifestyle habits constitute one of the biggest risk factors and explain the current epidemic proportions of the chronic degenerative diseases. In the year 2000, 76% of all deaths in the american continent were caused by non communicable diseases, this percentage being similar to that found among developed areas in Europe (86%) and the Western Pacific (75%). In that year alone there were 119,000 deaths associated to sedentary lifestyles. (CDC, 1996; Peña et al. 2000).

In Mexico, the National Survey of Health and Nutrition (ENSANUT, 2006) reported the prevalence of overweight in men and women over 20 years old to be 42.5% and 37.4% meanwhile obesity was rated at 34.5% and 24.2% respectively. In that same study abdominal obesity, defined as a waist circumference above 102 cm for men and 88 cm for women according to the National Cholesterol Education Panel (NCEP), showed a prevalence of 24.1% in men and 61.9% in women. Statistics from that same study showed that in the state of Baja California 6 out of every 10 adults above the age of 20 already have overweight or obesity, likewise 78% of the population have abdominal obesity. Another population survey on mexican adults determined the prevalence of physical activity classifying it according to its intensity, frequency and duration it showed 65.5% of the population as having insufficient activity, 16.8% with inactivity and only 17.7% with recommended levels of physical activity. (Acosta-Cázarez et al. 2006).

The role of sedentarism as an independent cardiovascular risk factor has been widely studied in the last four decades (Kannel et al. 1979; Wingard et al. 1982; Paffenbarger

et al. 1993; Rennie, et al. 2003). The results of these studies show a decrease in the prevalence of chronic non communicable diseases such as diabetes, obesity, cardiovascular disease, osteoporosis, metabolic syndrome and even some neoplasias, among physically active subjects. In Mexico according to the National Program of Physical Fitness And Sport 2001-2006, the habits of Mexicans in performing physical fitness or sporting activities is reduced to less than one hour a week, once a week and less than 7% of the population above 15 years of age do any kind of physical activity or sport significant enough to maintain their health.

The results of the National Survey of Health and Nutrition (ENSANUT, 2006), referring to nutritional status and abdominal obesity plus the determining of the prevalence of physical activity in the adult Mexican population (Acosta-Cázar et al. 2006), discriminate populations based solely on their gender and geography without specifying ethnic, socioeconomic characteristics or specific age groups. Based on the above, the present study has as its objective to learn the prevalence of the level of physical activity, nutritional status and abdominal obesity among physical education teachers that carry out their duties in elementary and junior high schools as well as in university professors of the bachelor's degree in physical activity and sport at the Universidad Autonoma de Baja California. The latter are a well educated population that in tandem with other areas of knowledge carry out activities and educate personnel in the field of physical education with the purpose of helping in the prevention and treatment of chronic non-communicable diseases.

OBJECTIVE

Estimate the prevalence of the level of physical activity, nutritional status and abdominal obesity amongst physical education teachers in the city of Mexicali, Baja California, Mexico.

MATERIALS AND METHODS

Subjects: In order to be able to carry out the present study it became necessary to solicit authorization from the Board of Directors of the Coordination of Physical Education of the Secretariat of Public Education in the city of Mexicali, Baja California and from the director of the School of Sports, at the Autonomous University of Baja California, explaining both in verbal and written form the purposes and benefits of carrying out the present study as well as its potential impact on society. The selected participants were chosen based on a personal invitation that was issued out requesting the authorization and participation from willing volunteers.

79 subjects were measured, 62 males and 17 females, 22 physical education teachers from public elementary schools, 39 physical education teachers from public junior high schools and 18 university professors that impart various subjects in the Bachelor's Degree in Physical Activity and Sports in the School of Sports, Mexicali Campus at the Autonomous University of Baja California (4 subjects were excluded due to pregnancy

and 9 due to failure to attend in order to participate in the study) with an average age of 45.8 ± 9.1 among males and 36.2 ± 9.3 among females.

In order to estimate the caloric expenditure of physical activity the short format (Spanish version) of the international physical activity questionnaire IPAQ (Craig, et al. 2003) was used. With a reliability (test re test with accelerometers) of 0.8 (P sperman) and the validity of 0.30 with similar questionnaires of 30. In this questionnaire, the description of the activities that are realized is taken into account, as well as the amount of days that they are realized and the amount of minutes that are spent realizing each one of them. These activities include all physical activities realized in the past 7 days, these range from the simple action of walking but more rigorous activities are also included. The questionnaire over the levels of physical activity was analyzed by classifying this variable into three levels, high, medium and low, in correlation to its value in MET's. These values were calculated based on the procedures reported by Ainsworth et al. (1993); according to this questionnaire, all types of walking are given an average MET value of 3.3. Excluding walking, all moderate intensity physical activity is valued at 4 and the one of vigorous intensity is valued at 8.

In order to obtain the anthropometric variables, weight was measured using a TANITA digital weight scale with a maximum weight capacity of 140 kilograms precise to within 100 grams and the anthropometric variable of height was measured using a SECA stadiometer, from these two variables, the body mass index was estimated. A Rosscraft 2 meter Lufkin chrome clad measuring tape was used in order to obtain the umbilical circumference from which the variable of abdominal obesity was determined. All the anthropometric measurements were taken in accordance with the guidelines established by the Instituto Nacional de Ciencias Médicas y Nutrición "Salvador Zubirán" (INCMSZ) in their manual of anthropometry, calculating the body mass index $BMI=(kg/ m^2)$, classifying based on the criteria established by the (WHO) with values <18.5 being underweight, >18.5 and <24.9 normal weight, >25 and <29.9 overweight and >30 obese. The waist circumference (cm) was classified under the criteria established by the NCEP ATP (III) with values of >102 cm in men and >88 cm in women seen as under risk to develop metabolic complications related to obesity, values of ≥ 94 y < 101.9 in men and ≥ 80 y <88 in women seen as risk substantially elevated and values of <94 in men and <80 in women classified as low risk.

RESULTS

For the statistical processing of the data, the program SPSS version 15.0 was used, the descriptive data of the subjects was obtained, the participants were then classified into varying categories with various cutoff points for risk. Also was obtained measures of central tendency and dispersion for all variables, generating tables and charts that reflect the most important data from this research.

The following results are from the 79 tested subjects (62 men and 17 women), in tables 1 and 2 the general characteristics of the professors can be observed, pointing out body mass indexes that in average are classified as overweight and in the case of abdominal

circumference the average are classified as elevated risk. The amount of MET's minute week for determining the level of physical activity was greater among female participants.

Table 1. General characteristics (62 male subjects)

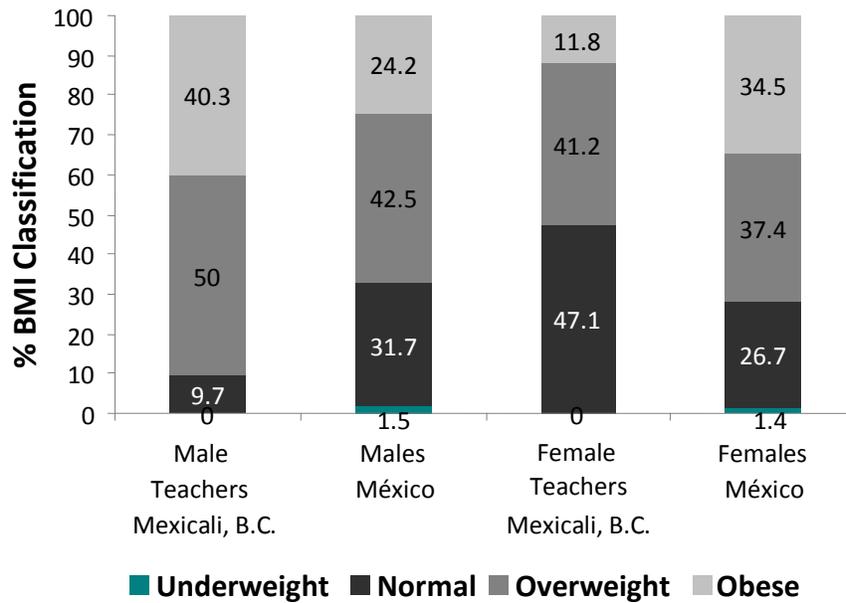
Characteristics	Median	Standard Deviation	Minimum	Maximum
Age (years)	45.4	9.1	26	67
Weight (kg)	86.4	11.2	58.1	108.2
Height (cm)	173.1	6.7	156.4	189.3
Abdominal Circumference (cm)	99.2	10.2	74.0	99.5
BMI (kg/m ²)	28.9	5.2	23.5	35.1
MET's	2937.4	2998.0	438	19680

Table 2. General characteristics (17 female subjects)

Characteristics	Median	Standard Deviation	Minimum	Maximum
Age (years)	36.2	9.3	23	54
Weight (kg)	70.5	20.3	50.1	130.3
Height (cm)	163	7.1	150.4	178.2
Abdominal Circumference (cm)	85.4	16.8	62.4	125.1
BMI (kg/m ²)	26.3	5.5	20.5	41
MET's	3020.4	2177.8	479	9573

In chart 1 the BMI percentage distribution is shown according to its classification by the WHO out of the total of professors according to gender, the comparison is made with the results obtained by the National Survey of Health and Nutrition 2006. None of the evaluated subjects were found to be classified as underweight, which is an indicator of malnutrition, on the other hand overweight and obesity were found in greater proportion among men than women.

Figure 1. Percentage distribution of the nutritional status



In figure 2 the abdominal circumference percentage distribution (abdominal obesity) is shown, classified according to risk for developing metabolic complications related to obesity as dictated by NCEP ATP (III) among all the professors according to gender, the comparison is made with the results obtained from men and women 20 years or older, from the National Survey of Health and Nutrition 2006. Among the evaluated subjects, men were shown to be in substantially higher risk than women.

Figure 2. Percentage distribution of abdominal obesity

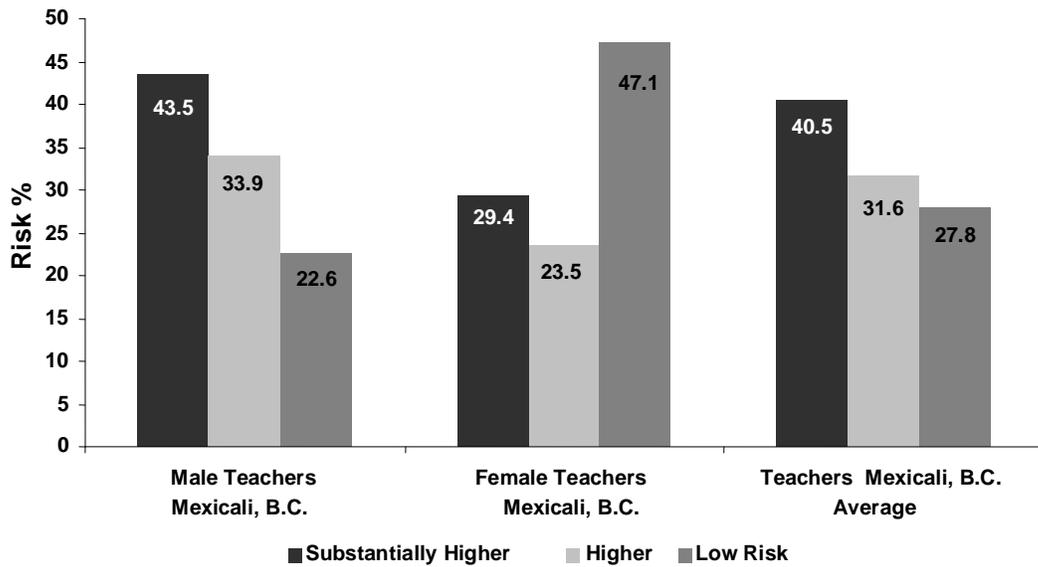
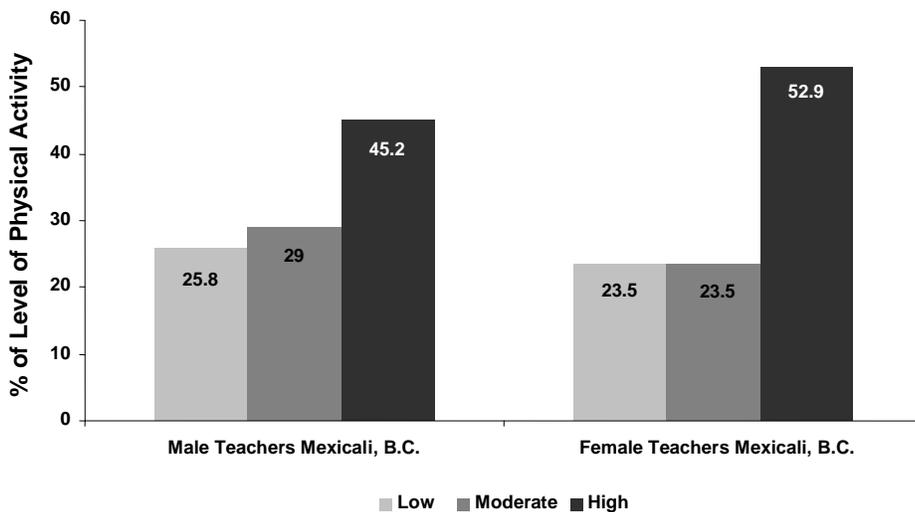


Figure 3 describes the percentage distribution of the level of physical activity among teachers according to gender, according to the criteria of IPAQ, in which similar percentage values are observed for both sexes when the values for both a high and moderate level of physical activity are combined, ranges fluctuating from 74.2% to 76.4%.

Figure 3. Percentage distribution of the level of physical activity



DISCUSSION

The first strategy in order to reduce the problem of obesity is to diagnose the problem by identifying at least some of modifiable factors associated with this. According to the

results obtained we can deduce that among the physical education teachers that participated in this investigation there is a large problem in relation to the presence of overweight and obesity, in that 80.3% of the cases present one of these. This percentage is considerably higher than the national average (69.3%) in Mexican adults according to the results shown by the most recent national survey of health realized in México (ENSANUT 2006). (Utilizing the same methodology in order to determine the data).

Abdominal obesity represented by substantially higher risk, is an indicator that evaluates the possible risk of developing metabolic syndrome, among female teachers a much lower percentage was observed (29.4%) than in their male counterparts (43.5%). However, if using the same methodological criteria we compare this variable with the results of ENSANUT 2006, comparatives are well above the national average with 24.1% of Mexican men and 61.9% that reported in Mexican adults.

In regards to the level of physical activity, similar levels can be observed in teachers from both sexes, showing that a sedentary lifestyle is uncommon among the educated population. However, the level of physical activity shown by the evaluated subjects contrasts with the results in relation to the high percentages of overweight, obesity and abdominal obesity.

A study using the IPAQ questionnaire as its measurement tool in México reported a lower level of physical activity than the one showed by ENSANUT 2006, administered to adolescents between the ages of 10 to 19. According to this study, 35.2% showed a high level of physical activity, 24.4% moderate and 40.4% a low level of physical activity. The levels of physical activity of the studied subjects contrast with the results found in population studies in Latin-American cities using the same methodology of the IPAQ questionnaire. For example, the results of Gómez et al. (2005) showed that adults in Bogota, Colombia had a prevalence of high and moderate level of physical activity of 63.6%, less than the one reported in this investigation, likewise, Matsudo et al. (2000) reported that adults in Sao Paulo, Brasil, had a prevalence of high and moderate level of physical activity of 46.5%.

Another population study of the prevalence of physical activity in Mexican adults that utilized a different methodology, classifying it according to its intensity, frequency and duration concluded that the prevalence of recommended physical activity is low and that of physical inactivity, high. (Acosta-Cázar et al. 2006).

Another study realized on similar subjects (Professors from the Instituto de Enseñanza Media de la Universidad de Salta, Argentina), reported notable sedentarism even though the same methodology was not used (Cruceiro et. al. 2007). Yet another study realized on university professors from the Federal University of Santa Catarina, Brasil in which factors and barriers towards physical activity were measured, concluded that the level of physical activity of the subjects was reduced and irregular and that the primary barrier towards physical activity was the lack of time (De Oliveira Martins, 2000).

The type of research can be identified as cross-limitation in the study, since it can not establish causal relationships, not to measure variables associated with obesity and physical activity level and also by failing to evaluate body composition methods to establish the percentage of body fat and muscle mass. Although, in regards to the nutritional status and abdominal obesity, the same methodology was used thereby facilitating comparisons to other national studies, the results of this study can serve as an argument for analyzing other populations with similar characteristics, with the purpose of developing and adequate description of the level of physical activity, nutritional status and abdominal obesity among physical education teachers.

CONCLUSIONS

From the results, we can observe that teachers present a very high prevalence of abdominal obesity, overweight and obesity, even higher than the national average in contrast with the level of physical activity that they are reporting. Taking into consideration the different factors related to chronic non communicable diseases, it is to expect that professionals of physical education, who within their scope work in various ways with health professionals in developing it, through physical activity, exercise and sport present risk factors associated with overweight and obesity. Also, considering their scholastic development and that they serve as social models of health, the presence of these risk factors within a high percentage of the evaluated teachers is highly paradoxical. As such, it is urgent that immediate measures be taken that will lead to the prevention and treatment of this diseases among these subjects.

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