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original article

Overweight/obesity in teachers: prevalence and associated factors

Sobrepeso/obesidade em professores: prevalência e fatores associados

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Abstract – The study aimed to assess the prevalence and sociodemographic, occupational and lifestyle factors associated with overweight/obesity in state teachers from a northeastern Brazilian city. A cross-sectional study involving teachers from the city of Jequié-BA initially selected by cluster sampling (schools) was conducted. The sample consisted of 300 teachers, including 72.7% (n=214) women. Sociodemographic, occupational and lifestyle data were investigated. Body weight and height were obtained by self-report. Prevalence ratios and 95% confidence intervals were estimated and a level of significance of 5% was adopted. The overall prevalence of overweight/obesity was 47.2%. The prevalence was significantly higher among male teachers (58.2%), married or cohabitating subjects (49.1%), whites and mulattoes (87.6%), teachers with an income > R$ 2,002.00 and a permanent contract (45.9%), and subjects who did not consume fruits or vegetables (49.1%). After multivariate analysis, only gender (95% CI = 0.16-0.66) and consumption of fruits and vegetables (95% CI = 0.25-0.98) remained significantly associated with overweight/obesity among teachers. These findings promote debate on the need for actions designed to encourage the adoption of an active lifestyle by the teacher population.

Key words: Obesity; Occupational health; Overweight.

Resumo – *O estudo teve como objetivo avaliar a prevalência e os fatores sociodemograficos, ocupacionais e hábitos de vida associados ao sobrepeso/obesidade entre professores da rede estadual de um município do nordeste brasileiro. Estudo de corte-transversal com professores da rede estadual do município de Jequié-BA selecionados, inicialmente, por conglomerados (escolas). A amostra foi constituída por 300 professores, 72,7% (n=214) do sexo feminino. Foram investigadas informações sobre as características sociodemograficas, ocupacionais e hábitos de vida. A massa corporal e a estatura foram obtidas por meio de informações autorreferidas. Foram estimadas as razões de prevalência e respectivos intervalos de confiança a 95%. Adotou-se nível de significância estatística de 5%. Encontrou-se uma prevalência global de sobrepeso/obesidade de 47, 2%, sendo essa prevalência significativamente elevada entre os professores do sexo masculino (58,2%), casados ou vivendo em união estável (49,1%), brancos e pardos (87,6%), com renda > R$ 2.002,00, com vínculo de trabalho efetivo (45,9%) e que não consumiam frutas e verduras (49,1%). Após a análise multivariada, apenas as variáveis sexo (IC 95% = 0,16-0,66) e consumo de frutas e verduras (IC 95% = 0,25-0,98), mantiveram-se associadas significativamente com sobrepeso/obesidade entre os professores. Estes achados fomentam a discussão sobre a necessidade de ações de incentivo a adoção de um estilo de vida ativo entre a população docente.*

Palavras-chave: *Obesidade; Saúde do trabalhador; Sobrepeso.*

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INTRODUCTION

Obesity is a global epidemic and has been identified as an important cause of current morbidity and mortality[1,2]. According to the World Health Organization (WHO)[2], the worldwide prevalence of obesity has almost doubled over the past 20 years. World population estimates indicate that about half a billion people (> 20 years) are considered obese and approximately 2.8 million die each year as a result of obesity[2]. In Brazil, the 2011 Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey (Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico – Vigitel)[3] identified a prevalence of obesity of 15.8%, corresponding to an increase of approximately 5% when compared to the results of 2006.

The expansion of obesity in Brazil is less intense among women[3], among richer and better educated socioeconomic groups[4], and in more developed regions of the country[5]. According to data from the Family Budget Survey[6], the prevalence of obesity is higher among men aged 45 to 54 years and among women aged 55 to 64 years.

Overweight and obesity are considered serious public health problems given the likelihood of developing adverse health effects such as metabolic and cardiovascular diseases[7,8], locomotor disorders, some types of cancer, and respiratory and dermatological disorders[2]. These problems have contributed to the current scenario of morbidity and mortality in the population and the consequent increase in healthcare spending[9].

Understanding that overweight/obesity has a multifactorial origin, different genetic, metabolic, behavioral (especially eating habits and physical activity), environmental, cultural and socioeconomic factors have contributed to its occurrence[9-11].In the teacher population, poor eating habits and lack of physical activity have been shown to be the most frequent factors associated with obesity, even in different regions of the country[12-14].

Changes in the working conditions of many professional categories, particularly teachers, have contributed to the development of lifestyle-related diseases[14,15], including obesity. The characteristics of the school environment, including inadequate infrastructure, the lack of equipment and its maintenance, insufficient human resources, a high volume of bureaucratic attributions, constant requirements of professional qualification, a large number of students per class, low wages, professional devaluation, poor control of work activities and little or no social support, have been extensively studied as causes of health problems in teachers[14,16,17].

Considering the health consequences of overweight/obesity[2], the increase in the prevalence of obesity in the adult Brazilian population and the lack of studies on this topic involving the teacher population, surveys identifying modifiable factors that influence nutritional status in this group are needed. Therefore, the objective of the present study was to estimate the prevalence of overweight/obesity among state teachers from a northeastern Brazilian city and to identify associated sociodemographic, occupational and lifestyle factors.

METHODOLOGICAL PROCEDURES

A cross-sectional study involving state teachers from the city of Jequié, Bahia, Brazil, was conducted between September and December 2010.

The city of Jequié is located in the southwestern region of Bahia, a border zone between savanna and forest areas. The estimated population of the municipality is 187,541 inhabitants and commerce is the main economic activity. The state school system is linked to the Regional Board of Education (DIREC 13) and comprised in the year of the study 716 teachers in permanent and temporary employment.

The estimated sample size necessary to represent the 716 teachers was 251 subjects based on an unknown prevalence of the outcome (50%), a tolerable error of 5%, a confidence level of 95% and a design effect of 1.5, adding 15% for possible losses and refusals.

Teachers who had been laid off or were at the disposal of other organs of the State Government and those on leaves of absence (licence award, maternity leave or vacation) were not included in the study. The participants were included according to school unit where the teacher worked and proportional to the size of the school (which is related to the number of students enrolled and the number of classes formed). First, the schools (n=12) were randomly selected and all teachers linked to the selected schools through a temporary contract, service provision or permanent employment were included in the study.

Overweight and obesity were determined based on body mass index [BMI = body weight (kg)/height (m^2)]. Body weight and height were obtained by self-report. According to Conde et al.[15] this measure shows good precision. For the purpose of analysis, the BMI data were dichotomized: overweight/obesity (BMI ≥ 25 kg/m^2) and low/normal weight (BMI < 25 kg/m^2) according to the nomenclature and cut-off values for adults adopted by the WHO[19].

The sociodemographic characteristics included age (up to 39 years or ≥ 39 years), gender (male or female), self-reported race/skin color (white, mulatto, black), marital status (single, married or cohabiting, divorced, separated, widowed), education level (high school or higher education), and monthly income (up to US$ 697,86 or ≥ US$ 697,86). Age and income were categorized according to the means obtained. The occupational characteristics comprised the following variables: years of formal work (up to 6 years or ≥ 6 years), weekly workload (up to 20 hours or ≥ 20 hours), type of contract (permanent or temporary), and number of classes in which the participant teaches (up to 7 classes or ≥ 7 classes). The variables years of work and number of classes were categorized according to the mean.

Lifestyle habits were evaluated using the Individual Lifestyle Profile (Perfil do Estilo de Vida Individual – PEVI) questionnaire. For the effect of analysis, only data related to the nutritional and physical activity components were used in the present study. This instrument consists of 15 questions divided into five components (nutrition, physical activity, preventive behavior, relationships, and stress control).

Eating habits (nutrition component) were evaluated by applying the following questions: Does your daily meals include at least 5 portions of fruits and vegetables? Do you avoid consuming fatty foods (fatty meat, fried foods) and sweets? Do you have 4 or 5 meals per day, including complete breakfast? The nutrition variable was categorized as follows: the response to each question of the instrument was rated on a Likert-type scale from 0 to 3. Values of 0 and 1, which correspond to "is not part of my lifestyle" and "sometimes", respectively, indicate a negative lifestyle profile (no). Values of 2 and 3, which correspond to "almost always" and "is part of my lifestyle", respectively, indicate a positive profile (yes).

With respect to the physical activity component, the participants answered the following questions: Do you perform at least 30 minutes of moderate/intense physical activity in a continuous or cumulative manner, 5 times or more per week? Do you perform exercise involving strength training and stretching at least twice a week? During your daily life, do you walk or cycle as a means of transportation and do you preferentially take the stairs instead of the elevator? Subjects who reported that performing at least 30 minutes of moderate/intense physical activity in a continuous or cumulative manner, 5 or more times per week, is part or is almost always part of their lifestyle were classified as active.

Statistical analysis

Descriptive statistical procedures (frequency, mean, and standard deviation) were used. The association between overweight/obesity and the sociodemographic, occupational and lifestyle variables was evaluated using a measure of statistical significance for categorical variables determined by the chi-squared test (χ^2). Exploratory multiple logistic regression analysis was used for simultaneous evaluation of the factors included in the study. Prevalence ratios and the respective 95% confidence intervals (CI) were calculated using the delta method. Variables with a p value ≤ 0.25 in crude analysis were included in the logistic regression model. The data were analyzed using the SPSS® 16.0 software and R program, version 2.5.

Ethical issues

The study protocol was approved by the Ethics Committee of Universidade Estadual do Sudoeste da Bahia (Protocol No. 209/2009). The participants received detailed information about the study and signed the free informed consent form.

RESULTS

The response rate was 90.1%, with 9.9% of losses. A total of 300 teachers aged 19 to 69 years (39.11 ± 10.18 years) participated in the study. Most teachers (72.7%) were women with higher education (85.5%). The mean monthly income of the participants was R$ 2,001.74 ± 1,076.22.

The overall mean BMI was 24.93 (± 4.38) kg/m^2. The mean BMI of men was 26.39 (± 4.14) kg/m^2 and the BMI of women was 24.35 (± 4.36)

kg/m². The overall prevalence of overweight/obesity was 47.2%. Table 1 shows the prevalence of overweight/obesity according to sociodemographic characteristics. Most overweight/obese subjects were older than 39 years, were men, reported mulatto or white race/skin color, and had a higher monthly income.

Table 1. Prevalence (%) of overweight/obesity according to the sociodemographic characteristics of the teachers studied (Jequié, 2010).

Variable	n	%	χ^2	p- value
Age				
To 39 years	52	36,6	5,186	0,023
> 39 years	64	50,4		
Gender				
Female	71	36.2	11.52	0.001
Male	46	58.2		
Color				
White	27	40.3	7.967	0.019
Brown	80	47.3		
Black	06	20.0		
Marital status				
Single	17	25.0	11.669	0.003
Married	85	49.1		
Separate	15	44.1		
Education				
Average	15	38.5	0.243	0.622
Higher	99	42.7		
Income				
Up to US$ 697,86	50	37.6	7.518	0.006
> US$ 697,86	45	57.0		

Table 2 shows the prevalence of overweight/obesity according to occupational characteristics and lifestyle habits. A high prevalence of overweight/obesity was observed among subjects with a weekly workload of > 20 hours, a permanent contract and a number of classes ≤ 6, insufficiently active subjects, and subjects who have at least 5 meals per day and who do not consume fruits and vegetables or fatty foods regularly. Despite the high prevalence, only the type of employment and consumption of fruits and vegetables showed statistical significance.

After multivariate analysis (Table 4), only gender (p=0.002), income (p=0.05), and consumption of fruits and vegetables (p=0.044) continued to be associated with overweight/obesity.

Table 2. Prevalence (%) of overweight/obesity according to occupational characteristics and lifestyle habits (Jequié, 2010).

Variable	n	%	χ^2	p- value
Hours (weekly)				
≤ 20 hours	43	38.1	1.85	0.173
> 20 hours	67	46.5		
Type of bond				
Temporary contract	20	31.7	3.98	0.046
Effective	96	45.9		
Nº Classes				
≤ 7 classes	64	44.4	0.88	0.347
> 7 classes	38	38.4		
Working time				
≤ 6 years	71	43.3	0.108	0.742
> 6 years	45	41.3		
Physical activity				
Active	25	39.7	0.316	0.574
Physical inactivity	90	43.7		
Nº daily meals (minimum 5)				
Yes	69	43.7	0.080	0.777
No	44	41.9		
Consuption fruit and vegetables				
No	59	49.1	3.600	0.050
Yes	56	37.6		
Consuption fatty foods				
No	70	45.5	0.799	0.372
Yes	46	40.0		

Table 3. Prevalence ratio and crude and adjusted confidence intervals between the prevalence of overweight/obesity and the variables studied (Jequié, 2010).

Variable	PR e CI(95%) $_{Li}$	RP e CI(95%) $_{Aj}$
Age		
To 39 years	1.00	1.00
> 39 years	1.75 (1.08-2.86)	1.28 (0.63-2.60)
Gender		
Female	1.00	1.00
Male	0.65 (0.49-0.86)	0.33 (0.16-0.66)
Color		
White	1.00	1.00
Black/Brown	1.04 (0.82-1.31)	1.31 (0.62-2.77)
Marital status		
Without a partner	1.00	1.00
With a partner	1.32 (1.09-1.61)	0.81 (0.53-1.24)
Income		
Up to US$ 697,86	1.00	1.00
> US$ 697,86	1.46 (1.09-1.94)	1.95 (0.99-3.87)
Hours (weekly)		
≤ 20 hours	1.00	1.00
> 20 hours	0.86 (0.70-1.06)	0.91 (0.44-1.88)
Type of bond		
Temporary contract	1.00	1.00
Effective	1.26 (1.02-1.55)	1.17 (0.32-2.10)
Consuption fruit and vegetables		
No	1.00	1.00
Yes	0.76 (0.58-0.99)	0.50 (0.25-0.98)

DISCUSSION

The results of the present study show a high prevalence of overweight/obesity in the population studied (47.2%). This prevalence was more pronounced among men and among subjects who reported a lack of regular consumption of fruits and vegetables.

A high prevalence of overweight/obesity is a trend observed in different populations[11,14,20]. In Brazil, data from the Vigitel survey involving adults with a fixed telephone from 27 Brazilian cities showed a high prevalence of overweight/obesity (48.5%). For the teacher population, this prevalence ranged from 51.04% in a study of teachers from the Federal University of Viçosa, Minas Gerais,[21] to 60% among teachers from the Nursing School of the Federal University of Minas Gerais, Belo Horizonte[22]. The present results agree with the literature findings in terms of the prevalence of overweight/obesity in the general population and are similar to those found for teachers.

The increase in the prevalence of excess weight and its characterization as a public health problem in developing countries such as Brazil is a situation observed since the last decades of the 20th century. This morbidity exhibits multifactorial characteristics including genetic and behavioral factors. Some hypotheses have been raised in an attempt to explain this increase of obesity in Brazil. One hypothesis suggests that the modernization of the country, including expansion of the service sector and an increased offer of jobs associated with low energy expenditure, is related to changes in physical activity, and the reduction in physical activity is a determinant factor of nutritional profile alterations[23]. Furthermore, changes in energy expenditure would also be related to dietary factors such as a reduction in fiber intake and an increase in the consumption of fats and sugars[23].

In the present study, the prevalence of overweight/obesity was higher among men. Studies conducted in Brazil[6] and in other countries such as Greece[20] and Spain[24] also identified a higher prevalence of overweight/obesity in the male population. Results of the Vigitel study[3] highlight that obesity is more frequent among men, especially younger men. Specifically among teachers, an increase in the prevalence of excess weight among men has been observed in studies conducted in Brazil[21,22] and in other countries[25]. In a study using data from the adult Brazilian population, Conde and Borges[15] emphasize that the incidence of obesity is higher among men, particularly among men who are pre-obese at the age of 20. The persistence of obesity is also more frequent in men, especially among younger ones. The incidence or persistence of obesity in adults is associated with the development of chronic diseases and an increased risk of early mortality[27].

The relationship between eating behavior and overweight/obesity is well documented in the literature[28,29]. In the present study, the prevalence of overweight/obesity was lower among subjects consuming vegetables and fruits, in agreement with other studies[12,13]. Fruits and vegetables comprise the food group that most contributes to weight control and the prevention

of diseases. The adequate intake of these foods reduces the risk of chronic diseases[29]. These results highlight the importance of the implementation and maintenance of adequate eating behaviors for teachers, as well as of knowledge about dietary profiles. The latter should contribute to a better understanding of the overweight/obesity epidemic in adults and to the planning of obesity prevention policies.

Therefore, the high prevalence of overweight/obesity among teachers observed in the present study indicates the need for preventive and control measures of this morbidity in order to prevent the negative consequences of excess weight in the adult population[9,30].

Some limitations of the study need to be mentioned, such as its cross-sectional design which does not permit to draw conclusions about the cause-effect relationships between the prevalence of overweight/obesity and the variables studied, especially because of the difficulty in establishing temporality. Another important aspect is the fact that formal work already denotes a process of selection of workers with adequate health. Furthermore, workers on sick leave were excluded. These procedures may indicate possible bias of the study related to the healthy worker effect.

However, despite these possible limitations, the study investigated a large number of subjects employing procedures of data collection and analysis widely used in the literature. The basis found in the literature demonstrates that the present results support evidence of explanatory models of the prevalence of excess weight in the population, providing useful information for teacher healthcare actions.

CONCLUSION

The prevalence of overweight/obesity was high among the teachers studied, particularly among men and subjects consuming less fruits and vegetables. Nutrition education actions designed to encourage the consumption of fruits and vegetables in the teacher population are recommended. These actions could be incorporated in the school routine in such a way that would favor body weight control and consequently reduce the risk of diseases associated with excess weight in this population.

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