

EXCESS WEIGHT IN ADULT DWELLERS OF A SUBNORMAL URBAN AGGLOMERATION

Excesso de peso de adultos residentes em um aglomerado urbano subnormal

Exceso de peso en adultos residentes de un barrio de chabolas

Original Article

ABSTRACT

Objective: To assess the prevalence of excess weight and potential risk factors in adult dwellers of a subnormal urban agglomeration. **Methods:** Observational cross-sectional study based on a sample of 582 adults aged 20-59 years living in the subnormal urban agglomeration of Coelhos (Recife). Excess weight was estimated by body mass index (BMI) greater than or equal 25 kg/m². Possible associations with age, sex, race/color and socioeconomic factors (education and employment status) were assessed. The effect on the occurrence of excess weight was estimated by calculating odds ratio (OR) and adjusting simple logistic regression models. Accuracy and statistical significance of ORs were assessed through 95% confidence intervals and the Wald test. Significance level was set at 5%. **Results:** The prevalence of excess weight was 62.5% (n=364), with higher proportions among women (66.1%; n=251) than men (56.0%; n=113), with a gradual increase up to the age group 40-49 years and a decline from then on. In this age group, the risk of excess weight was 2.6 times. In addition to age, being female and not working were also identified as risk factors. **Conclusion:** The high prevalence of excess weight identified in the adult population of the subnormal urban agglomeration of Coelhos was associated with sex, age and employment status, constituting, therefore, potential risk factors for the problem.

Descriptors: Overweight; obesity; adult; poverty.

RESUMO

Objetivo: Avaliar a prevalência de excesso de peso e possíveis fatores de risco em adultos residentes em um aglomerado urbano subnormal. **Métodos:** Estudo observacional do tipo transversal, baseado em uma amostra de 582 adultos, na faixa etária de 20 a 59 anos, residentes no aglomerado urbano subnormal dos Coelhos (Recife). Definiu-se excesso de peso pelo índice de massa corporal (IMC) maior ou igual a 25kg/m². Foram avaliadas possíveis associações com idade, sexo, raça/cor e fatores socioeconômicos (escolaridade e condição de trabalho). O efeito sobre a ocorrência de excesso de peso foi estimado pelo cálculo do Odds Ratio (OR), mediante o ajuste de modelos de regressão logística simples. A precisão e significância estatística desses ORs foram avaliadas através de intervalos de 95% de confiança e do teste de Wald. Adotou-se nível de significância de 5%. **Resultados:** A prevalência de excesso de peso foi de 62,5% (n=364), sendo maior nas mulheres (66,1%; n=251) do que nos homens (56,0%; n=113), com um aumento progressivo até a faixa etária de 40 a 49 anos, passando a declinar a partir de então. Nessa faixa, houve um risco de excesso de peso de 2,6 vezes. Além da idade, pertencer ao sexo feminino e não trabalhar também representaram condições de risco. **Conclusão:** A elevada prevalência do excesso de peso na população adulta residente no aglomerado urbano subnormal dos Coelhos se mostrou associada ao sexo, faixa etária e condição de trabalho, constituindo-se, assim, como possíveis fatores de risco do problema.

Descritores: Sobrepeso; Obesidade; Adulto; Pobreza.

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RESUMEN

Objetivo: *Evaluar la prevalencia del exceso de peso y los posibles factores de riesgo en adultos residentes de un barrio de chabolas.*
Métodos: *Estudio observacional del tipo transversal basado en una muestra de 582 adultos en la franja de edad entre 20 y 59 años, residentes de un barrio de chabolas de los Conejos (Recife). Se definió el exceso de peso por el índice de masa corporal (IMC) mayor o igual a 25kg/m². Fueron evaluadas las posibles asociaciones con la edad, el sexo, la raza/el color y los factores socioeconómicos (escolaridad y condición de trabajo). El efecto de la ocurrencia del exceso de peso ha sido estimado por el cálculo del Odds Ratio (OR) mediante el ajuste de modelos de regresión logística simple. La precisión y la significancia estadística de los ORs fueron evaluadas a través de los intervalos de 95% de confianza y de la prueba de Wald. Se adoptó el nivel de significancia del 5%. **Resultados:** La prevalencia del exceso de peso fue del 62,5% (n=364) y mayor para las mujeres (66,1%; n=251) que los hombres (56,0%; n=113) con un aumento progresivo hasta la franja de edad entre 40 y 49 años cuando empieza a disminuir. Hubo un riesgo del exceso de peso de 2,6 veces en esta franja de edad. Además de la edad el hecho de ser mujer y no trabajar también representan condiciones de riesgo. **Conclusión:** La elevada prevalencia del exceso de peso de la población adulta residente de un barrio de chabolas de los Conejos se asoció al sexo, la franja de edad y la condición de trabajo, constituyéndose de esa manera, como posibles factores de riesgo del problema.*

Descriptor: *Sobrepeso; Obesidad; Adulto; Pobreza.*

INTRODUCTION

As a component of the epidemiological transition that has characterized the nosographic human history from the second half of the twentieth century, the nutritional transition in Brazil has been taking place surprisingly quickly, changing morbidity and mortality patterns⁽¹⁻³⁾. Conceptually, the process involves replacing the hegemonic model of infectious processes and deficiency diseases by the epidemic emergence of chronic noncommunicable diseases (NCDs), changing, in the range of only three generations, the nature, magnitude, context and therefore the health sector priorities in Brazil and most other least developed countries^(4,5).

In this respect, overweight and obesity constitute major risk factors for morbidity and mortality of adult populations, being associated with 63% of the total global deaths. Of this total, 78% of them occurred in low- and middle-income countries⁽⁶⁾. Moreover, in 2010, it is estimated that overweight and obesity have resulted in 3.4 million deaths, loss of 3.9% in life expectancy and 3.8% of years lost due to disability⁽⁷⁾.

Excess body weight, represented by overweight/obesity, is characterized by the accumulation of fat, exceeding acceptable standards for normal anthropometric measurements in different degrees and integrating, as the most common element, a complex of comorbidities known as chronic noncommunicable diseases (NCDs)^(8,9). In this context, obesity stands out as both disease and associated factor and is considered one of the most important risk factors for other diseases in this group⁽¹⁰⁻¹²⁾.

The worldwide prevalence of overweight and obesity has shown a rapid and progressive increase in recent decades, so that today 2.1 billion adults are in this condition, which represents almost 30% of the world population and constitutes thus a real pandemic: from 1980-2013, excess weight increased 27.5% among adults worldwide^(1,8). In the United States, obesity affects over 35% of adults, representing the country with the highest prevalence worldwide^(5,13). According to the World Health Organization (WHO)⁽¹⁴⁾, at least 2.8 million people die each year as a result of excess weight. It is estimated that by 2015, approximately 2.3 billion adults will have excess weight and over 700 million of which will be obese, with a chance of reaching by 2030 figures of 2.6 and 1.1 billion overweight and obesity people, respectively⁽¹⁵⁾. In developing countries, the increasing trend of excess body weight can be treated as the epidemiological reproduction of the historical development of developed countries, as documented in research that present data on temporal and geographical trends in some Latin American countries⁽¹⁶⁾.

In the particular case of Brazil, there is a trend of an increasing prevalence of overweight and obesity as one of the striking features of the country's nutritional transition process⁽²⁻⁴⁾. In this respect, from the 1990s, the country began to show higher frequencies in the lower income strata^(12,17). The social mobility of these conditions, especially obesity, with a trend of reduction in the quartile of higher income and increased offset for households classified in the lowest economic strata, is, so to say, the striking epidemiological feature of the nutritional transition process of the Brazilian population in the last three decades^(3,4,12). The obesity trend in the context of poverty in Brazil puts this condition as a priority topic for the field of public health at the present time since their biological and social consequences have become more complex and, to some extent, unpredictable^(1,3,18). According to a survey conducted by the Ministry of Health in 2013⁽¹⁰⁾, 68.3% of Brazilian adults were overweight.

Sociodemographic factors (gender, age, race, education and income) have been gaining prominence as potential risk factors for overweight and obesity, although differences in the prevalence and the specificity of these

associations deserve further research in different regions of Brazil⁽¹¹⁾.

According to the *Instituto Brasileiro de Geografia e Estatística – IBGE* (Brazilian Institute of Geography and Statistics)⁽¹⁹⁾, the term “*favela*” is conceptualized today as subnormal urban agglomeration, which consists of areas “arranged in a disorderly, dense and needy manner – mostly of essential public services”. It should be reiterated thus the distinction between areas defined as normal and hence abnormal, reaffirming them as exclusion zones. This concept has a certain degree of generalization, so as to encompass the diversity of informal settlements in the country, known as *favela*, *invasão*, *grota*, *baixada*, *comunidade*, *vila*, *ressaca*, *mocambo*, *palafita*, among others. According to the population census held in 2010 by the IBGE⁽¹⁹⁾, about 6% of the population lives in irregular settlements (subnormal agglomerations), representing almost twice the proportion found in 1991 (3.1%). The concern about the effects of excess weight, which was an epidemiological peculiarity of the wealthier social classes, is now represented in disadvantaged groups^(12,20,21), which imposes a theoretical reflection on its dynamics and the development of more effective public policies for the prevention and control of diseases in these segments. This idea is what justifies the development of the present study, which aims to assess the prevalence of excess weight and potential risk factors in adult dwellers of a subnormal urban agglomeration.

METHODS

This is an observational cross-sectional study based on data from research titled “*Saúde, nutrição e serviços assistenciais numa população favelada do Recife: um estudo baseline*” (Health, nutrition and care services in a population of a *favela* in Recife: a baseline study). It is a survey aimed to establish the baseline of a cohort project with intervention for the next ten years, specifically focused on the health problems of dominant interest (or priority) in the investigated period. The study was conducted in the subnormal urban agglomeration of Coelhos, located in the Boa Vista neighborhood, in the city of Recife, capital of the state of Pernambuco. Data collection took place from June to December 2014 in the population assisted by the Family Health Strategy in the area assessed.

The sample was calculated based on a reference universe of 3,816 adults aged 20-59 years from the database of the *Sistema de Informação de Atenção Básica – SIAB* (Primary Care Information System) – Recife. Epi Info 6.04 module StatCalc (Centers for Disease Control and Prevention, Atlanta, USA) was used considering a prevalence of 53.8% of overweight and obese adults in this age group in the Metropolitan Region of Recife in Pernambuco according

to the *III Pesquisa de Saúde e Nutrição* (III Research on Health and Nutrition) held in Pernambuco in 2006⁽²²⁾. It was assumed a 4.5% estimation error incorporating an extra 10% in the sample to offset possible losses and stratifications for internal comparisons (hypothesis testing), thereby obtaining an initial minimum sample size of 518 participants. The final sample consisted of 582 adults. In reality, the number of observations assessed here is a subset of the representative sample of people aged 20 or more, calculated to represent the universe of adult dwellers of the Coelhos community. It was used a probability sample and the households visited were nominated by simple random sampling, with a probability proportional to the population of each block of households. The differences in sample numbers in some results are due to the loss of observations because of incomplete questionnaires due to data inconsistency.

Data were collected through questionnaires applied to the adult responsible for the household, and anthropometric measurements (weight and height) were performed in all the selected adults. To this end, eight interviewers and five anthropometrists, as well as two field supervisors, including the researcher, were trained to carry out field activities. A pilot study was conducted to test the collection instrument and the logistics of field work in order to verify their feasibility and possible adjustments in the questionnaires or data collection procedure. Information on some biological factors were collected: gender, age, race/color and socioeconomic factors (education, employment status).

Variables related to the nutritional status (weight and height) were analyzed using the body mass index (BMI) according to the recommendations of the World Health Organization (WHO)⁽²³⁾, being classified as underweight ($\leq 18.5 \text{ kg/m}^2$), normal range (≥ 18.5 and $< 25 \text{ kg/m}^2$), overweight (≥ 25 and $< 30 \text{ kg/m}^2$) and obesity ($\geq 30 \text{ kg/m}^2$). It was excess weight (overweight and obese) the BMI greater than or equal to 25 kg/m^2 .

Weight was measured using Seca® 876 digital scale with capacity of up to 250 kg and 100 gram accuracy, with subjects standing barefoot, wearing minimal clothing and without any objects in pockets, hands or head. For the height measurement, it was used an Alturaexata Ltd. portable stadiometer accurate to 1 mm in its entire length. Volunteers were upright, barefoot, with arms and hands resting at the sides.

The anthropometric measurements were performed twice by trained technicians, and, to ensure the accuracy of the measurements, they were measured in duplicates. When the difference between measurements exceeded 0.5 cm in height and 100 g in weight, the measurement was performed again writing down the two measurements with

the closest values in order to obtain the average of these measures.

For each of the possible risk factors listed in this study, the effect on the occurrence of excess weight was estimated by calculating the odds ratio (OR) adjusting simple logistic regression models. The accuracy and statistical significance of these ORs were assessed using 95% confidence intervals and the Wald test. All tests adopted a significance level of 5%. Statistical analysis was performed using SPSS version 13.0 (SPSS Inc., Chicago, USA).

The present study was approved by the *Comitê de Ética de Pesquisa do Instituto de Medicina Integral Professor Fernando Figueira CEP - IMIP* (Research Ethics

Committee of the Professor Fernando Figueira Integral Medicine Institute), with protocol number 4017-14. All subjects were informed about the voluntary participation in the study and signed a Free Informed Consent Form.

RESULTS

Table I describes the prevalence of nutritional status in the sample of adults (20-59 years) according to BMI classifications, with a detailed stratification results given the biological and socioeconomic variables. It was found that the cumulative prevalence of overweight/obesity was 62.5% (n=364), with 56% (n=113) among men and

Table I - Nutritional status of adults (20-59 years) of a subnormal urban agglomeration (Coelhos), according to some biological and socioeconomic variables. Recife, PE, 2014.

Variables	Underweight	Normal	Overweight	Obesity	Total	
	n (%)	n (%)	n (%)	n (%)	n	%
Biological						
Gender						
Male	9 (4.5)	80 (39.6)	64 (31.7)	49 (24.3)	202	100.0
Female	12 (3.2)	117 (30.8)	128 (33.7)	123 (32.4)	380	100.0
Age group						
20-29	13 (9.2)	62 (43.7)	41 (29.9)	26 (18.3)	142	100.0
30-39	1 (0.7)	47 (31.8)	56 (37.8)	44 (29.7)	148	100.0
40-49	5 (3.0)	45 (27.4)	60 (36.6)	54 (32.9)	164	100.0
50-59	2 (1.6)	43 (33.6)	35 (27.3)	48 (27.3)	128	100.0
Race/color						
White	3 (2.8)	41 (37.6)	29 (26.6)	36 (33.0)	109	100.0
Black	6 (6.4)	24 (25.5)	34 (36.2)	30 (31.9)	94	100.0
<i>Parda</i>	12 (3.3)	126 (34.5)	122 (33.4)	105 (28.8)	365	100.0
Socioeconomic						
Employment status						
Not working ^a	3 (3.8)	22 (27.5)	23 (28.8)	32 (40.0)	80	100.0
Unemployed ^b	6 (5.1)	41 (34.7)	41 (34.7)	30 (25.4)	118	100.0
Social benefits ^c	1 (1.9)	23 (43.4)	16 (30.2)	13 (24.5)	53	100.0
Self-employed (urban or rural)	2 (1.8)	31 (27.4)	37 (32.7)	43 (38.1)	113	100.0
Employed	5 (3.7)	43 (32.1)	51 (38.1)	35 (26.1)	134	100.0
Sporadic work ^d	4 (4.8)	37 (44.0)	24 (28.6)	19 (22.6)	84	100.0
Education						
Illiterate/Incomplete primary (grades 1-5)	5 (4.8)	35 (33.7)	32 (30.8)	32 (30.8)	104	100.0
Complete primary (grades 1-5)/ Incomplete primary (grades 6-9)	3 (2.1)	47 (32.9)	48 (33.6)	45 (31.5)	143	100.0
Complete primary/Incomplete secondary	6 (5.0)	44 (36.4)	29 (24.0)	42 (34.7)	121	100.0
Complete secondary/incomplete higher education/complete higher education	7 (3.3)	71 (33.8)	80 (38.1)	52 (24.8)	210	100.0

a: Never worked and housewives **b:** Has already worked but was unemployed for 30 days or more **c:** retired, pensioner, provisory benefits **d:** handyman/street vendor, volunteer work

66.1% (n=251) among women. Regarding the distribution by age groups, it is noteworthy that 9.2% (n=13) of the observations in the age group 20-29 years fit into the category underweight while 69.5 % (n=114) of those in the range 40-49 years fit into the category overweight/obesity, representing the highest values of these two conditions. In terms of ethnicity, 59.6% (n=65) of white individuals were overweight/ obese, a condition that was prevalent in 68.1% (n=64) of black individuals.

With regard to socioeconomic conditions, nearly 70% (n=55) of those who did not work were overweight or obese,

corresponding almost to the situation of self-employed individuals (70.8%; n=80), a category in which the problem presented the highest frequencies. Among the recipients of social promotion services, 54.7% (n=29) were overweight or obese. In descriptive terms, education, distributed into four categories, did not present discrepant results in the classification of nutritional status, highlighting, however, that the highest proportion of excess weight was identified among adults with the second lowest level of education (65 1%; n=93).

Based on the descriptive results and taking into account that excess weight, constituted by the overweight/obesity

Table II - Weight excess of adults (20-59 years) of a subnormal urban agglomeration (Coelhos), according to some biological and socioeconomic variables. Recife, PE, 2014.

Variables	Sample	Weight excess		OddsRatio	p*
	n	n	%	IC 95%	
Biological					
Gender	582				
Male	202	113	55,9	1,0	0,016**
Female	380	251	66,1	1,5 (1,0-2,2)	
Age group (years)	582				
20-29	142	67	47,2	1,0	0,000**
30-39	148	100	67,6	2,3 (1,4-3,8)	
40-49	164	114	69,5	2,6 (1,6-4,1)	
50-59	128	83	64,8	2,1 (1,3-3,4)	
Race/color	568				
White	109	65	59,6	1,0	0,440
Black	94	64	68,1	1,4 (0,8-2,6)	
<i>Parda</i>	365	227	62,2	1,1 (0,7-1,7)	
Socioeconomic					
Employment status	582				
Sporadic work ^d	84	43	51,2	1,0	0,050**
Not working ^a	80	55	68,8	1,7 (1,0-3,0)	
Unemployed ^b	118	71	60,1	2,3 (1,3-4,2)	
Social benefits ^c	53	29	54,7	1,2 (0,6-2,3)	
Self-employed (urban or rural)	113	80	70,8	1,4 (0,8-2,5)	
Employed	134	86	64,2	2,1 (1,1-4,0)	
Education	578				
Complete secondary /incomplete higher education					
/complete higher education	210	132	62,9	1,0	0,757
Complete primary/incomplete secondary	121	71	58,7	0,9 (0,6-1,5)	
Complete primary (grades 1-5)/incomplete primary (years 6-9)	143	93	65,0	1,1 (0,7-1,7)	
Illiterate/incomplete primary (grades 1-5)	104	64	61,5	0,8 (0,5-1,3)	

CI95%: confidence interval = 95% * Pearson's chi-squared **p (<0.05)

a: Never worked and housewives b: Has already worked but was unemployed for 30 days or more c: retired, pensioner, provisory benefits d: handyman/street vendor, volunteer work

binomial, is the main nutritional problem in the population studied, we carried out an analytical assessment of risk factors (odds ratio) using bivariate analyses (Table II). It is shown, therefore, that the chance of occurrence of excess weight has increased significantly from the age of 30, rising from 47.2% (n=67) to 67.6% (n=100) and 69.5% (n=114), respectively, in the age groups 30-39 years and 40-49 years ($p < 0.001$). Female gender constituted another biological risk factor (OR 1.5). Conditions such as not working (OR 1.7; CI95: 1.0-3.0), being unemployed (OR 2.3, CI95: 1.3-4.2) and being employed (OR 2.1, CI95: 1.1- 4.0) were statistically significant risk factors for the occurrence of overweight/obesity, taking as a reference the group “sporadic work.”

DISCUSSION

The present study is one of the pioneering approaches to analyze the nutritional status of adults in a characteristically poor urban space, as is the case of populations living in *favelas*, where about 12 million people live in Brazil⁽¹⁹⁾. Therefore, it is surprising to find that the epidemiological profile identified in the sample does not differ significantly from the statistics reported for urban populations in Brazil, whether in regard to low birth weight (“proxy” for energy-protein malnutrition or EPM) or the opposite problem, namely the condition of excess weight, including overweight and obesity. Indeed, the most recent survey assessing the nutritional status of the urban adult population in Brazil, the 2008-2009 *Pesquisa de Orçamento Familiar – POF* (Consumer Expenditure Survey)⁽²⁴⁾, shows that 2.7% of the population is underweight. On the other hand, considering the overweight/obesity binomial, data on the national prevalence described by the POF report the occurrence of 62.6% among men and 64.9% among women. Internationally, it is accepted that the United States have the highest statistics of excess weight in adults aged over 20 years (70.9% in men and 61.9% in women), followed by Australia (68.6% and 56.7%) in adult men and women, respectively. Mexico, following the order of citation, presented a prevalence of 66.8% and 71.4%⁽⁷⁾.

In this brief epidemiological panel, it is evident that the values found in the Coelhos community are practically equivalent to the results obtained in international and national representative surveys of the population. This observation is of great importance, not only for the restricted case of the population of *favelas*, but also for highlighting that the most characteristic parameter of the nutritional transition (the overweight/obesity pandemic) is not restricted to the most general context of Brazil and the world, affecting also poverty layers or ecosystems. It is a process that diffuses homogeneously even in populations living in the most

adverse socioeconomic and environmental conditions, such as the case of families living in *favelas*^(12,25). And although these data are of limited validity, its preliminary notification stands out as an indication of a possible broader trend: the homogenization of the epidemiological situation of the population. That is, the trend of equalizing the problem in all geographical areas (regional, state, macro and micro-regional) and all social strata.

Considering – in a more restricted and conceptually more appropriate framework – the nutritional situation of populations living in *favelas*, two contributions can be compared, like the study⁽¹²⁾ conducted in a subnormal urban settlement of Maceió, AL that showed that 41.2% of adults were overweight or obese. It is, therefore, a much lower prevalence than that detected in our study. Also conducted with dwellers of *favelas* in São Paulo, another study observed that 36.5% of adults had cumulatively overweight and obesity classifications⁽²⁶⁾. That study dates from 1995 and it is likely that the current prevalence of excess weight is much higher, considering the temporal trends of evolution of the problem in Brazil.

Another approach would be the assessment of some factors associated with excess weight as a risk factor. In this perspective, there are no systematic analytical contributions to understand the problem in subnormal urban settlements in Brazil, so that the references herein mentioned have been retrieved from studies with a very generic scope.

It was observed in our study that the proportion of overweight and obesity increased with age, reaching the highest values until the age of 49 years. For different biological and behavioral reasons, the occurrence of excess weight tends to increase with age with a possible inflection point located between 50-59 years. This general trend showed changes in pace and final results in Brazil over the two last decades due to the nutritional transition that has remarkably changed the morbidity and mortality profile of our population⁽⁷⁾.

In fact, the relationship between the risk of overweight/obesity and advancing age is a universal observation, with rare exceptions. A study in Colombia describes that obesity increases substantially with age⁽²⁷⁾. These results are also in agreement with data obtained by the *Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico – VIGITEL* (Risk and Protective Factors for Chronic Diseases Surveillance through Telephone Inquiry)⁽¹⁰⁾, which reported that overweight frequency tends to increase with age up to 54 years in both genders. It is a result consistent with other studies that show a direct relationship between increasing weight and age of the individual^(11,12,28,29). The positive association between age and excess weight could be explained partly by a decline in metabolic rates that physiologically accompanies the aging process and

by the usual reduction in physical activity⁽³⁰⁾. The highest prevalence of excess weight among women is a worldwide event with rare exceptions⁽⁷⁾. In Brazil, the monitoring of a time series that started in 1974 indicates that the time rate of increase of overweight/obesity has been about three times higher among men and two times higher among women⁽²⁴⁾. A study conducted in Peru found that excess weight was slightly more prevalent in men than in women, but obesity was specifically more frequent among women⁽³¹⁾. Research⁽³²⁾ with impoverished families registered in the *Programa Comunidade Solidária* (Solidarity Community Program) of the Brazilian Government found that 54.5% of women and 30.7% of men were overweight or obese. In a low-income population in Northeastern Brazil⁽¹²⁾ it was also found a higher frequency of excess weight among women (46.2%) rather than men (32.6%). In Ribeirão Preto, SP⁽³³⁾, it was found a higher prevalence of overweight among men, while obesity was more prevalent among women.

The inexistence of an association between excess weight and ethnicity (color/race) was also found in adults of a study in Salvador⁽³⁴⁾ and Bahia⁽²⁸⁾, and in research with the population aged 20-59 years in the city of Santo Ângelo, RS. This expresses that the possible effects of prejudiced relationships, which leads to discrimination in the market for goods and services, no longer manifests at the community level, producing implications that are unfavorable to the state of protein-calorie nutrition.

As to education, it was observed in this study that the prevalence of obesity increased according to the level of education up to complete primary/incomplete secondary education, when the trend is interrupted. This result is similar to that of another study⁽³⁵⁾ with adult population who benefit from the *Bolsa Família* (Brazil's Family Grant Program) in the city of Curitiba, PR. This may suggest that although the population presented higher levels of education, their low socioeconomic status favored the purchase of cheaper and high-calorie foods, contributing to the increased frequency of obesity. VIGITEL⁽¹⁰⁾ obtained different results, showing that the obesity rate tends to decrease with increasing levels of education, revealing that 14.3% of those with 12 or more years of education had obesity, a fact that is in contrast with lower levels of education.

In the present study, no statistically significant association was found between education and excess weight, corroborating another study conducted in the municipality of Santo Ângelo (RS)⁽²⁸⁾. At the international level, the importance of the association between education and excess weight is highlighted, as in the study conducted with adults from Finland⁽³⁶⁾ and Colombia⁽²⁷⁾. In Brazil, this condition was identified in the study conducted in Ribeirão Preto, SP⁽³³⁾ and in the study carried out with low-income women in Duque de Caxias, RJ⁽³⁷⁾.

The variable "employment status" was considered a variable associated with excess weight due to its epidemiological importance as a potential determinant of diseases and for presenting a p-value close to "significant condition" (0.050). Population-based research conducted in Rio Branco, AC⁽³⁸⁾ identified the association between employment status and excess weight, corroborating with the present study. However, these results differ from studies conducted with adults in São Paulo⁽³³⁾ and Maceio⁽¹²⁾. They found that the group of cases not included in the labor market showed a prevalence of excess weight of greater magnitude than those who reported having an occupation at the time of interview.

The authors recognize the limitations of the present study, which should be understood as a preliminary approach of a long-term project to be developed in this community: 10-year cohort. The main limitation was the analytical inventory of the problem of overweight/obesity, restricted to just five groups of explanatory variables. Undoubtedly, understanding excess weight demands – since it is a multifactorial problem – a more complex approach, which, by the way, is not the dominant objective of our study. Moreover, the study has a fundamental limitation of epistemological character, that is, given its cross-sectional design, effects and possible causal antecedents are taken simultaneously, disregarding the before/after relationship that, by formal logic, should condition the relationship.

CONCLUSION

The high prevalence of excess weight in the adult population living in the subnormal urban agglomeration of Coelhos was associated with gender, age and employment status, constituting therefore potential risk factors for the problem.

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