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Obesity awareness among elders living in rural area: a household survey

Autorreconhecimento da obesidade de idosos residentes em áreas rurais: um inquérito domiciliar

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Abstract – The acceptance of the disease is essential to health self-care, elder's awareness regarding obesity is suggested to influence their search for health services, and consequently, in obesity's treatment. This study aimed to verify obesity awareness of elders living in rural areas and associated socioeconomic and demographic factors. We conducted a cross-sectional household survey with 562 individuals, who were older than 60 years and were rural residents from a Brazil southeast city. The identification of obesity awareness was consisted in the agreement between the self-referred obesity and the diagnosis criteria using the body-mass index >27Kg/m^2. The associated socioeconomic and demographic factors were: gender, age range, marital status, education and income. Descriptive statistical analysis, Kappa index and logistic regression (p <0.05) were conducted. The highest percentage of elders were men (53.6%), 60 ├ 70 years old (62.6%), married (67.8%), studied for 4|-8 years (40.0%) and with an individual monthly income of one minimal wage (45.7%). The prevalence of obesity according to the body-mass index was 34.7% and the self-referred 15.1%, which was classified as regular agreement by the Kappa coefficient (k= 0.232; p<0.001). The majority of the elders with obesity were not aware of this condition (64.6%), with higher odds ratio for men than for women (OR=2.34; CI=1.29-4.77). We found high obesity prevalence among elders residents in the rural area, who did not recognize themselves with this condition. Moreover, elderly men presented lower obesity awareness than women.

Key words: Body-mass index; Diagnosis; Elder; Obesity.

Resumo – *A aceitação do agravo é essencial para o autocuidado, infere-se que o autorreconhecimento do idoso acerca da obesidade influencia na procura de serviços de saúde e, consequentemente no seu tratamento. Este estudo objetivou verificar o autorreconhecimento da obesidade de idosos rurais e os fatores socioeconômicos e demográficos associados. Trata de um inquérito domiciliar e transversal com 562 idosos residentes na área rural de um município do Sudoeste do Brasil. A identificação do autorreconhecimento da obesidade consistiu na concordância entre a obesidade autorreferida e o critério de diagnóstico segundo o Índice de Massa Corporal >27 Kg/m^2. Os fatores socioeconômicos e demográficos associados ao autorreconhecimento foram: sexo, faixa etária, estado conjugal, escolaridade e renda. Foram realizadas análise descritiva, coeficiente de Kappa e regressão logística (p<0,05). O maior percentual de idosos foi de homens (53,6%), com 60– 70 anos (62,6%), casados (67,8%), 4 |- 8 anos (40,0%) de estudo e renda mensal individual de um salário mínimo (45,7%). A prevalência de obesidade de acordo com o Índice de Massa Corporal correspondeu a 34,7% e a autorreferida 15,1%, sendo caracterizada concordância regular de acordo com o coeficiente de Kappa (k= 0,232; p<0,001). A maioria dos idosos com obesidade não se reconheceu nesta condição (64,6%), com maiores razões de chance entre o sexo masculino em relação ao feminino (OR=2,34; IC=1,29-4,77). Constatou-se alta prevalência de obesidade nos idosos da zona rural, sendo que a maioria não se reconheceu nessa condição. Também foi evidenciado que particularmente os homens idosos apresentaram menor autorreconhecimento quando comparados às mulheres.*

Palavras-chave: *Diagnóstico; Idoso; Índice de massa corporal; Obesidade.*

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INTRODUCTION

Obesity has been considered as a public health problem, with expressive prevalence in elderly population[1]. A nationwide study verified that 32.7% and 12.4% of the Brazilian elders presented overweight and obesity, respectively[2]. A survey conducted with elderly residents in the rural area of this study city verified a significant obesity prevalence (34.4%)[3], which highlights the need to know the associated factors of this event, with the intent of proposing health strategy.

The aetiology of obesity is complex and multifactorial, since it is a consequence of genetic, environmental, life style and emotional factors[4]. In general, this condition is due to an unbalance between energy intake and consumption, which is accentuated by ageing[5].

Alongside the ageing process, some physiological changes may predispose to obesity. Among them, muscle-mass loss and consequently increase in fat accumulation, especially in abdominal area, should be highlighted[6]. The decrease in muscle mass is also responsible for a slower metabolism[5], which contributes to the appearance of the disease.

Additionally, previous reports in the literature have associated obesity with changes in hormone levels, such as the faster reduction in endogenous hormones and the change in appetite and self-image neuromodulators[5]. Furthermore, elders have propensity to be more sedentary, which leads to a low total daily energy expenditure and favour obesity in these individuals[6].

Obesity may influence health status, as well as in life expectancy in elders. Previous studies conducted with the elderly population demonstrated this morbidity predicts mortality[7], chronic diseases, systemic arterial hypertension, diabetes mellitus, dyslipdemia[8] and depressive symptoms[9].

Considering the referred consequences, the assistance to obese elders and their peculiarities is a relevant matter. Moreover, the perception and knowledge about obesity influence in the search for health services, and consequently, in its treatment[10]. Since the acceptance of the disease is essential to health self-care, a question is raised: Does elders who presents obesity recognize themselves in such condition?

Brazilian population surveys verified that the when using elders' self-referred measures (height and weight), an underestimation of the prevalence of overweight and obesity occurred[11,12], which might lead to negligence regarding the care to this condition. Until then, no studies verifying obesity awareness of elders were found.

In addition, rural area population may present restricted access to health services due to transport limitations, distance from social and health resources and low-income[13]. Those characteristics may aggravate the difficulties in obesity care and in monitoring this population. Hence, the results from this study may guide the health strategies to treat and prevent obesity among elders from rural areas.

The aim of this study was to verify obesity awareness among elders living in rural areas and the associated socioeconomic and demographic factors.

METHODOLOGICAL PROCEDURES

This was a cross-sectional household survey conducted in the rural area of Uberaba-MG city, which is located in southeast of Brazil. This investigation is a segment of a larger study entitled "Health and quality of life of the elderly population living in rural áreas of Uberaba city". The population was 1297 elders, who lived in the rural area and were registered by the primary health care (PHC) in May 2010, which represents 100% elderly population coverage in the area. In this study, individuals with 60 years or older were considered elders, according to what is recommended to developing countries, including Brazil.

Inclusion criteria was 60 years or older; to live in the rural area of Uberaba-MG city; do not present cognitive decline; to consent with the study; to be able to undergo anthropometrical assessment. From the total sample, the exclusions due to do not attend the eligibility criteria: 105 (8.1%) due to cognitive decline; 75 (5.8%) did not consent with the study; 173 were not able to undergo anthropometrical assessment. Additionally, other losses were: 11(0.8%) died; 7(4.4%) were not found by the researchers in three visits; 117 (9%) changed from that address; 3 (0.2%) were hospitalized; and 79 (6.1%) were excluded due other reasons. Therefore, 562 elders participated in this study (Figure 1).

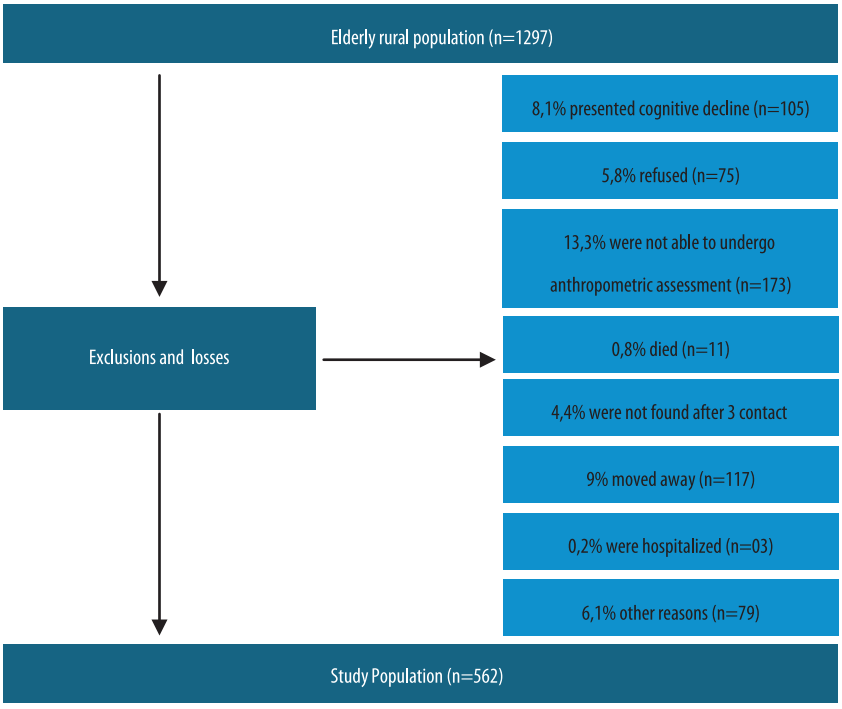

Figure 1. Study population composition.

From March 2010 to March 2011 the data collection was conducted in the elders' residences by 14 trained interviewers. The interviews were reviewed by field supervisors and, in the occurrence of inconsistencies,

they returned to the interviewer to be corrected.

Before the beginning of the interviews, the cognitive status of each elder was assessed by the Mini Mental State Exam (MMSE), which had been translated and validated to Brazilian population[14]. The scale score range is 0-30 points, and the cut-off points were: 13 to illiterate people, 18 to people with 1-11 years of education and 26 to people with more than 11 years of education[14].

The interview was conducted with elders who did not present cognitive decline following the adopted criteria. The Brazilian OARS Multidimentional Functional Questionnaire (BOMFAQ)[15] was used to characterize the socioeconomic variables, such as gender (female and male); age range (60├ 70, 70├ 80, 80 or older in years); marital status (never married or lived with a companion, married, widow and divorced); education (no education, 1|-4, 4|-8, 8 and 9 or more years of education); and individual income (no income, <1, 1-| 3, 3-| 5, > 5 minimum wages).

The anthropometric measures (weight and height) were assessed by a portable digital scale and by a flexible and inelastic measure tape, which was fixed in a wall, in a regular and plane surface, without baseboards; the elders were barefoot, in a standing position, with both foots united and looking at the horizon line[3]. With these anthropometric measures, the body-mass index (BMI) was calculated using the equation BMI = weight(kg) / height^2(m).

In this study, obesity diagnosis criterion was defined by the elderly specific BMI recommendations (BMI>27kg/m^2)[16], since it is more sensitive to Brazilian population[17]. Despite the criticism regarding the use of BMI to the obesity diagnosis in elders due to the ageing-related changes in the body composition, the criterion choice was based in the fact that BMI is easy to be measured and it is associated to morbimortality indicators in elders[1].

In order to verify obesity awareness, firstly it was asked if the elder presented obesity (yes or no) and, later, the answer was compared to the diagnosed obesity according the adopted criterion in this investigation[16]. Thus, when an elder who referred himself as obese and was diagnosed as presenting this condition (BMI>27kg/m^2), the situation was considered as an elder who can identify himself as obese[16].

An electronic dataset in Excel® Software was created to gather all the collected data. The interviews information, after review and codification, was processed in a computer, by two researchers, in double entry. When the data typing was complete, the consistence between the entries in both datasets was analysed. In the occurrence of inconsistent data, the original interview was re-analysed and a correction was applied. Lastly, the dataset was exported to the software Statistical Package for Social Science (SPSS) version 22.0 to be analysed.

The descriptive analysis was done by simple frequency distribution. In order to verify the obesity awareness an agreement analysis was conducted using the Kappa coefficient, which strength was classified as: insignificant (0), low (0.01-0.20), regular (0.21-0.40), moderate (0.41-0.60), substantial (0.61-0.80) and almost perfect (0.81-0.99)[18]. To verify the associated so-

cioeconomic and demographic factors to obesity non-recognition a logistic regression was conducted. Qualitative variables were re-categorized in a way to become dichotomic: marital status (with or without a companion); education (illiterate or literate); income (with or without income). Age remained with the same categorization as before (60├ 70, 70├ 80 e 80 or older). The dependant variable was obesity awareness (yes or no) and as independent variables gender, age range, marital status, education and income. The tests were considered significant when $p<0.05$.

This study was approved by the Human Research Ethics Committee from the Federal University of the Triângulo Mineiro (Approval number 1477). The elders were contacted in their homes, where the aim of the research, the consent form and relevant information was provided. Only after the acceptance and the signature in the consent form the interview was conducted.

RESULTS

In this study, the highest percentage of elders were men (53.6%), 60├ 70 years old (62.6%), married (67.8%), studied for 4|-8 years (40.0%) and with an individual monthly income of one minimal wage (45.7%), Table 1.

The socioeconomic characteristics of the elders living in the rural area are displayed in Table1.

Table 1. Frequency distribution of socioeconomic and demographic variables of elders living in rural areas. Uberaba, Minas Gerais, Brazil, 2011.

Variables		n	%
Gender	Women	261	46.9
	Men	301	53.6
Age range	60 ├ 70	352	62.6
	70 ├ 80	163	29.0
	80 or more	47	8.4
Marital status	Never married or never lived with a partner	46	8.2
	Married	381	67.8
	Widow	97	17.3
	Divorced	38	6.8
Education (in years)	No education	114	20.3
	1|-4	174	31.0
	4|-8	225	40.0
	8	21	3.7
	9 or more	28	5.0
Individual monthly income	No income	60	10.7
(in minimum wages) *	< 1	20	3.6
	1	257	45.7
	1-| 3	185	32.9
	3-| 5	30	5.3
	> 5	10	1.8

* Minimum wage during the period of the data collection: R$ 545,00.

The sample included 562 elderly with mean height of 162.34±9.14 cm, mean weight of 66.78±13.31 kg and BMI of 25.4±4.67 kg/m2.

Diagnosed obesity prevalence, following the adopted criteria, represented 34.7%, while the self-referred corresponded to 15.1%, Table 2.

Most of the elders with diagnosis of obesity were not aware that they had this condition (64.6%), which is, a high percentage of false negatives (low sensitivity). The specificity was much higher, in which 95.6% of the elderly were aware of their condition of obesity. Through the kappa coefficient, there was a regular agreement between self-reported obesity and diagnosed according to the criterion adopted (k = 0.232; p<0.001), Table 2.

Table 2 presents the prevalence of self-referred and diagnosed obesity inelders. Additionally, the agreement analysis by the Kappa coefficient is also displayed.

Table 2. Agreement about the self-referred and diagnosed obesity in elders living in rural areas. Uberaba, Minas Gerais, Brazil, 2011.

Self-referred Obesity	Obesity (BMI)*							
	Yes		No		Total			
	n	%	n	%	n	%	κ**	p†
Yes	69	35.4	16	4.4	85	15.1	0.232	<0.001
No	126	64.6	351	95.6	477	84.9		
Total	195	34.7	367	65.3	562	100		

*Obesity was defined as BMI >27 Kg/m^2; *k: Kapa coefficient; †p<0.05.

In order to verify the socioeconomic and demographic factors association with the obesity awareness, the data of 195 elders diagnosed as obese, following the adopted criterion, was analysed.

Table 3, presents the logistic regression model to the socioeconomic and demographic factors that were associated to obesity awareness.

Table 3. Frequency distribution according to the awareness of obesity and the logistic regression model of its associated factors. Uberaba, 2011.

Variables	Obesity awareness				Regression models			
	Yes		No					
	n	%	n	%	OR (CI)	*p*†	OR* (CI)	*p*†
Gender								
Men	23	25.3	68	74.7	2.34(1.27-4.32)	0.006	2.48(1.29-4.77)	0.006
Women	46	44.2	58	55.8	1		1	
Age range								
60├ 70	51	37.2	86	62.8	1		1	
70├ 80	16	33.3	32	66.7	0.84(0.42-1.68)	0.629	0.75(0.36-1.59)	0.466
80 or older	2	20.0	8	80.0	0.42(0.86-2.06)	0.286	0.48(0.93-2.46)	0.379
Marital Status								
With a partner	49	34.5	33	65.5	1		1	
Without a partner	20	37.7	93	62.3	0.86(0.45-1.67)	0.675	0.95(0.47-1.91)	0.898
Education								
Literate	57	35.0	106	65.0	1		1	
Illiterate	12	37.5	20	62.5	0.89(0.40-1.96)	0.784	1.01(0.43-2.36)	0.986
Income								
With income	58	34.4	105	64.4	1		1	
Without income	11	35.6	21	65.6	1.05(0.47-2.34)	0.896	1.49(0.63-3.52)	0.355

*OR: Adjusted odds ratio; p<0.05; 1: reference category.

Obese elderly men presented higher rates of do not identify themselves as presenting this condition, when compared to women (OR=2.34; CI=1.29-4.77). Although there was an absence of statistical significant difference, an increase in the self-referred obesity rates was evident with the increase in age. Furthermore, marital status (p-0.898), education (p=0.986) and income (p=0.355) were non-significant predictors, Table 3.

DISCUSSION

The concern with obesity in Brazil has been increasing due to the expanding rates of this condition evidenced by population enquires[19]. We found an expressive obesity prevalence among elders residents in the rural area. Other investigations identified a variety of prevalence between elders who lives in urban areas from Brazilian cities (48,7%)[17] (49,6%)[20] or who lives in a rural area in China (7,1%)[21] (29,1%)[22]. The variability may be due to the location differences and the obesity diagnosis criterion that was adopted. Moreover, national studies with elders living in rural areas are yet scarce, which prejudices comparison with the findings.

The high prevalence of obesity in elders suggests the establishment of monitoring, prevention and control programs for this disease, since it causes adverse effects to health condition and quality of life worsening[17]. Several strategies to reduce body weight are available, such as change in lifestyle, healthy nutritional habits and exercising regularly[23]. However, the perception and recognition of obesity are essential in the search for a health service, and, consequently, in the effectiveness of these interventions[10].

Most elders diagnosed with obesity according to their BMI, in the present study, did not identify themselves as obese. Previous evidences about health awareness have been suggesting that elders that suffers from some chronic morbidity sometimes do not perceive themselves in that condition when there are no disease consequences, which corroborates with our data[24,25]. In addition, elders tend to accept the adverse weight-related adverse situations[26], and, consequently, seek treatment for this condition only when associated comorbidities manifestations occur. These findings are concerning, since these individuals may develop some health condition due to the lack of qualified treatment to obesity.

In contrast, the results show high specificity, which is, use of self-recognition may contribute to identify those who are obese in the elderly population. Until this moment, few studies have discussed obesity awareness among elders. The literature about this theme is focused in the knowledge about this population about their anthropometrical measures and in their capacity of referring them[11,12,27]. Populational surveys verified only the underestimation of the prevalences of overweight and obesity using self-referred measures[11,12].

Similar situation was observed in a rural area of Brazilian Northeast region, in which the majority of the individuals did not know their weight and height, especially among the elders[27]. This study found a regular agree-

ment between self-referred and diagnosed obesity, which reinforces the need of the measurement of the anthropometrical characteristics for the obesity diagnosis in the elders living in rural areas.

Despite its limitations, the use of BMI for the diagnosis of obesity has been suggested in epidemiological studies, mainly, since it is easy to collect associated to the fact that index is associated to morbimortality predictors in elders[1]. However, the adoption of a more sensitive cutoff point is necessary for the Brazilian elderly population (BMI >27 Kg/m^2)[17].

Another aspect that that should be mentioned is that men presented higher chances of do not identify themselves as obese when compared to women. A study conducted in Brazilian Northeast region verified that men were more satisfied with their body image when compared to women, even when they were overweight[28]. The hypothesis to these findings is related to cultural and aesthetics aspects, which affect mostly women in a search for a normality standard considered acceptable by society[29]. Additionally, women present a better perception of signs and symptoms of a disease when compared to men[30].

Our results reinforce the need of strategies aiming to sensitise the elderly, especially men, about the relevance of the nutritional status monitoring. A fundamental question to these strategies effectiveness is the knowledge about obesity and their consequences to health[10]. International evidence has shown that public education campaigns are effective interventions in the empowerment of individuals in their self-care and in the overweight control[10].

In the context of rural areas, transport limitation, the distance of social and health resources and unfavourable income may make more difficult the elders access to health resources[13]. Since the population of this study presented a complete coverage by the primary health care, the professionals from this team may use health education during domiciliary visits, aiming to create in elders living in rural areas the interest for their health condition, such as the awareness of obesity.

As limitations, this was a cross-sectional study, which prevents to establish a causality association. Moreover, the use of the BMI as the obesity diagnosis criterion presents limitation due to the changes in elders' body composition. Other studies are necessary, in order to provide a broad comprehension about obesity and their associated factors in elders and allow new discussions in the scientific field.

CONCLUSION

The prevalence of diagnosed obesity corresponded to 34.7%, while the self-referred obesity presented a prevalence of 15.1%. A regular agreement was observed and the majority of the obese elders were not aware they were obese. Men presented twice more chances of do not identify themselves as obese, when compared to women.

Our findings reinforce the relevance of strategies that improve the knowl-

edge and perception of elders living in rural areas, especially men, regarding obesity and its adverse effects, aiming to provide stimuli in the search of qualified care and, consequently, the treatment and prevention of this disease.

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