ORIGINAL ARTICLE

MORBIDITIES IN ELDERLY RELATED TO OVERWEIGHT IN A GERONTOLOGICAL UNIT

ABSTRACT
Objective: to determine the nutritional status of elderly attended in a gerontological unit and the main morbidities related to overweight. Method: descriptive study, quantitative and transversal. The technique used for data collection was face to face interview, from questionnaires with closed and semi-open questions, organized into thematic blocks and annotation of anthropometric measurements. The data were analyzed and presented in two tables and a figure. The research project was approved by the Research Ethics Committee, protocol nº 015/10. Results: 214 elderly were evaluated 19.2% male and (80.8%) female, 50.0% had overweight, 36.4% strophic and 13.6% underweight 68.2% hypertension, 55.6% dyslipidemia and 54.7% musculoskeletal system diseases (DASM). Regarding morbidity with significant association to overweight 56.2% hypertensive and 62.7% diabetics. Conclusion: the prevalent condition of overweight indicates the need for weight control. Descriptors: Aging; Nutritional Assessment; Body Mass Index; Overweight; Obesity; Morbidity.

RESUMO
Objetivo: determinar o estado nutricional de idosos atendidos em uma unidade gerontogeriátrica e as principais morbilidades relacionadas ao excesso de peso. Método: estudo descritivo, de corte transversal quantitativo. A técnica utilizada para coleta dos dados foi a entrevista face a face a partir de questionário composto por questões fechadas e semiabertas, organizado em blocos temáticos e anotação das medidas antropométricas aferidas. Os dados foram analisados e apresentados em uma figura e duas tabelas. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, protocolo nº 015/10. Resultados: foram avaliados 214 idosos, 19.2% masculino e (80.8%) feminino, 50.0% apresentavam excesso de peso, 36.4% estrôficos e 13.6% baixo peso, 68.2% hipertensão, 55.6% dislipidemia e 54.7% doenças do aparelho músculo-esquelético (DAME). Em relação às morbilidades com associação significativa ao excesso de peso, 56.2% hipertensos e 62.7% diabéticos. Conclusão: a condição de excesso de peso prevalente indica a necessidade de controle do peso. Descritores: Envelhecimento; Avaliação Nutricional; Índice de Massa Corporal; Sobrepeso; Obesidade; Morbidade.

RESUMEN
Objetivo: determinar el estado nutricional de los ancianos atendidos en una unidad gerontológica y las principales morbilidades relacionadas al sobrepeso. Método: estudio descriptivo, de corte transversal cuantitativo. La técnica utilizada para la recolección de datos fue de entrevista cara a cara de cuestionario compuesto por preguntas cerradas y semi-abiertas, organizadas en bloques temáticos y anotación de las medidas antropométricas. Los datos fueron analizados y presentados en una figura y dos tablas. El proyecto de investigación fue aprobado por el Comité de Ética de la Pesquisa, el protocolo nº 015/10. Resultados: fueron evaluados 214 ancianos (19.2%) masculinos y (80.8%) femeninos, 50.0% presentaban exceso de peso, 36.4% estróficos y 13.6% bajo peso, 68.2% hipertensión, 55.6% dislipidemia y 54.7% enfermedades del aparato músculo-esquelético (DAME). En relación a las morbilidades con asociación significativa al exceso de peso, 56.2% hipertensos y 62.7% diabéticos. Conclusión: la condición de exceso de peso prevalece indica a la necesidad de control de peso. Descriptores: Envejecimiento; Evaluación Nutricional; Índice de Masa Corporal; Sobrepeso; Obesidad; Morbilidad.
INTRODUCTION

Changes in morbidity and mortality profile are what characterize the epidemiological transition. In this context, rather than acute processes that resolve quickly through healing or death, prevail chronic diseases and their complications, which often mean decades of use of health services, medications, doctor visits and long-term hospitalizations. Some of these diseases, features of this new profile, are: diabetes, hypertension, sequelae of cerebrovascular accident (CVA), limitations caused by heart failure, obesity, fractures after falls, chronic obstructive pulmonary disease and dependence determined by Alzheimer's dementia.¹

Several factors are responsible for the increased prevalence of NTCDs, among which are genetic factors. However, behavioral factors (sedentarism, diet, smoking and drinking) assume a considerable importance because there is the possibility of being changed the modification of daily habits of life.²

It is evident the predominance of deaths related to non transmissible chronic diseases in individuals over 60 years old. It is estimated to occur, in the coming decades, an epidemic increase of NTCDs, in most developing countries due to the higher prevalence of factors associated with the occurrence of these diseases.³

The major causes of death, worldwide, have highlighted the cardiovascular disease (CVD) as the most prevalent of the NTCDs. These present pathological changes of the heart and blood vessels (veins and arteries), presenting different clinical manifestations, among which may be mentioned: ischemic heart disease, congestive heart failure, cerebrovascular disease and hypertension.³

The association between overweight and hypertension causes thickening of the ventricular wall and greater cardiac volume, increasing the probability of heart failure.⁴

In 2004, there were 31.8% of deaths from cardiovascular disease, in relation to the total deaths occurred in the country, in the same year. When analyzing the main causes of death in the Brazilian elderly population, by sex, in 2003, diseases of the circulatory system appear as the first cause of death among women, followed by deaths from poorly defined causes: neoplasms (especially breast), respiratory diseases and diabetes. Among men, the groups are the same, although neoplasms (in this case mainly, the prostate) occupy second place.⁴

The morbidity and mortality related to non transmissible diseases are caused by various risk factors, such as high blood pressure, high serum cholesterol concentrations, inadequate intake of fruit and vegetables, overweight and sedentarism. Soon, the modifiable risk factors underlie the major NTCDs and justify the most deaths from these diseases around the world, regardless of sex and age.⁵

The main causes of death among elderly are, primarily, circulatory diseases, followed, as the magnitude, of neoplastic diseases, digestive, infectious and parasitic and external causes. It is noteworthy that these deaths do not occur homogeneously, in all socioeconomic groups.⁶

Regarding the nutritional transition, also observed in recent decades, may be defined as a process in which sequential changes occur in the pattern of nutrition and consumption, related to economic, social and demographic changes, and in the health profile of the population. Thus, malnutrition is no longer the most important nutritional problem in developing countries, and obesity in developed countries.⁷

Similar to what is happening in relation to demographic and epidemiological patterns, modifications in the change process in Brazil and other developing countries, presents peculiarities, such as increased on the prevalence of obesity, regional variations (related to socioeconomic and cultural factors) and coexistence of malnutrition/deficiency and overweight.⁸

The characteristics and development stages of the nutrition transition are different in various countries of Latin America. However, a point issue that draws attention is the remarkable increase in obesity prevalence, in different population subgroups in almost all Latin American countries. Within this context, obesity has been consolidated as a nutritional problem associated with a high incidence of cardiovascular disease, cancer and diabetes, influencing in this way, in the morbidity profile of the population.⁹

Obesity is considered the most important nutritional disorder in developed countries, affecting developing countries. As per the latest statistics, 10% of the population of poor countries and more than a third of the U.S. population, are above desirable weight.¹⁰

Changes in dietary and nutritional standards of Brazilian population in all social strata and age groups, are observed during the process of nutritional transition. This transition is characterized by a reduction in the prevalence of nutritional deficits and the
significant increase of overweight and obesity.\textsuperscript{3}

The increasing prevalence of obesity in Brazil becomes even more relevant. It was found that this increase, despite being distributed in all regions of the country and in different socioeconomic strata of the population, is proportionally higher among low-income families.\textsuperscript{10}

The evidence that the nutritional transition caused serious changes over time is apparent. The gradual reduction of malnutrition and the increase of overweight, regardless of age, sex or social class, is a reality that long studies has reveal. Noting this phenomenon, it is necessary to mobilize the authorities in order to establish priorities for the development of strategies for Public Health action. To combat overweight and non transmissible chronic diseases, food education actions and encouraging to the practice of physical activity are noteworthy.\textsuperscript{11}

The biggest nutritional problem found in the age group between 50 and 65, is overweight, which is associated with chronic degenerative diseases. Over 80, slimness and loss of lean body mass, are major problems. Diseases associated with low BMI are tuberculosis, chronic obstructive pulmonary disease, lung and stomach cancer. On the other hand, those that are associated with high BMI values are cerebrovascular and cardiovascular diseases, diabetes mellitus and in men, colon cancer.\textsuperscript{12-4}

According to the World Health Organization (WHO) in the period between 1995 and 2000, there was an increase in the number of obese individuals. This number increased from 200 to 300 million, representing nearly 15% of world population.\textsuperscript{2}

The prevalence of overweight and obesity in Brazil, following the global trend, is also increasing. Three Brazilian researches - NSFAE (National Survey of Family Expenditure), NSAN (National Survey About Nutrition) and SLS (Survey on Living Standards) - held in 1975, 1989 and 1999, respectively, compared the Northeast and Southeast regions and identified overweight and obesity increased, in most population groups. The prevalence of obesity among adults aged 20 years or more in the period 1975-1989, nearly doubled: from 4.4% to 8.2%, reaching 9.7%, in 1999. Regarding overweight, the prevalence increased from 21% to 32% in the first period in which the comparison was made. The results of the SLS, presented separately for the Northeast and Southeast regions, showed prevalences of overweight of 34.2% and 40.9%, respectively.\textsuperscript{15}

It is proven that obesity is an independent cardiovascular risk factor. With increasing prevalence, it is considered a public health problem that occurs both in developed and in developing countries and constitutes an adverse impact on public coffers. The occurrence of obesity in old age potentiated the effects of other morbidities of high prevalence in this stage of life: hypertension, diabetes mellitus non insulin dependent and cardiovascular diseases. Despite the many factors that determine the overweight, the aspects related to the adoption of diets with high energy values, rich in animal fats and low intake of fruits, vegetables and fiber, are aspects that deserve attention.\textsuperscript{16}

Both overweight as obesity are associated to psychological distress, depression, eating disorders, distorted body image and low self esteem. Anxiety and depression have higher prevalence of three to four times among obese individuals, who are also stigmatized and suffer social discrimination.\textsuperscript{15}

The number of Brazilians with overweight (BMI\textsuperscript{2} 25) and obesity (BMI\textsuperscript{2} 30) increases significantly, despite the efforts of the population awareness campaigns for prevention and control. It is estimated that in Brazil, 38.8 million people aged 20 or older are overweight. This number corresponds to 40.6% of the population in this age group, where 10.5 million are obese.\textsuperscript{17}

Overweight and obesity, besides the problems they bring to health, imply serious socioeconomic consequences. The costs of overweight for Health System are significant. Direct costs are involved with the treatment. The indirect are related to reduced of productivity, increased absenteeism and premature death. According to estimates by the International Obesity Task Force, the direct costs attributable to obesity in industrialized countries, represents from 2\% to 8\% of total on health care.\textsuperscript{15}

**OBJECTIVE**

- To determine the nutritional status of elderly treated in a gerontological unit and the main morbidity related to overweight.

**METHOD**

Descriptive study, quantitative and transversal, held at the Nucleus for the Elderly Care (NEC), ambulatory unit linked to the Elderly Program (PROIDOSO)of the Extension Pro-Rectory of the Federal University of Pernambuco/UFPE. The technique used for data collection was face to face interview from questionnaire with closed
and semi-open questions, organized into thematic blocks and annotation of anthropometric measurements.18

The selected population for the study, consisted of patients of both sexes, non-institutionalized, registered in NEC/UFPE, which had Medical or Nursing attendance during the period from January 2004 to August 2009, which corresponded to a total of 1002 elderly, according to the registration of existing records in Service.

In defining the sample size, an expected prevalence of variable “elderly overweight” of 50% was considered. This value was chosen, although maximize the sample size, since studies about the prevalence of overweight in the elderly in the literature, does not present consensus in terms of this classification, and the investigated populations have different characteristics related to this study. The maximum acceptable error is estimated at 5% and a confidence level of 95%.

The sample size was 214 elderly, who were selected by systematic sampling, respecting the criterion of proportionality existing in the source population, in terms of quantity of elderly registered in the NEC, in the given period and distributed by sex.

For the sample selection, a list of all the records of patients of both sexes was structured, ambulatory attended, between January 2004 and August 2009. The individuals selection was given by lot, in order to compose a systematic sample.

This form of choice of the sample elements, guarantee the randomness and, undoubtedly, maintains the existing proportionality in the source population, in terms of quantity of elderly registered per year and sex distribution.

The period of data collection took place between March and July 2010, conducted by a researcher, reducing the risk of errors during anthropometric measurements.

To select the sample, the following inclusion criteria were used: to be registered in NEC/UFPE and have been attended at the medical or nursing clinic from January 2004 to August 2009; to have a minimum age or over 60 years · a condition which defines elderly, according to Law No. 8842/94, which deals with the National Policy of the Elderly; to participate in the study voluntarily, with signature of the Informed Consent Form; and as exclusion criteria: elderly with compromised for measuring weight and height; elderly with impaired communication and cognition that could interfere with data collection during the interview; bedridden or institutionalized elderly.

The nutritional status of the elderly was categorized according to the Body Mass Index (BMI) obtained by dividing the body weight in kilograms by height in squared meters (kg/m²).

For this classification, the recommendation proposed by Lipschitz (1994) was used, as shown in Figure 1.

![Figure 1. Classification of Body Mass Index. Source: Lipschitz (1994).](image)

Morbidity identified in the medical or nursing records available on the Service, associated with overweight, were recorded.

A database has been assembled and subsequently, performed a quantitative analysis of the information through systematic process with statistical basis. Data analysis was processed using the Statistical Package for Social Sciences (SPSS) for Windows, version 18.0.

Initially, the analysis of the variables involved in the study and gender differences was performed; then undertook a bivariate analysis, aiming to identify possible associations between variables of interest to the binary variable, overweight (yes or no). The chi-square test of Pearson Independence was used and, when appropriate, the Fisher exact test. It was adopted as a criterion for rejecting the null hypothesis, the significance level of 5%.

The presentation of the results met the recommendations of the Brazilian Association of Technical Standards - ABNT NBR 14724.

The research project was submitted to appreciation of the Ethics in Research Committee of the Health Science Center of the Federal University of Pernambuco, and was approved as CEP/CCS/UFPE protocol No. 015/10. Thus, the investigation met the requirements previously established in Resolution 196, of 10 October 1996, of the Ministry of Health, about the development of scientific research involving humans.

To research participants, was delivered the Informed Consent Form in duplicate, stating...
the research objectives, anonymity guaranteed and the possibility of waiver, if necessary.

**RESULTS**

![Classification of nutritional status of the elderly according to the Body Mass Index.](image)

As for morbidities associated with overweight, there was a predominance of systemic hypertension (SH), 68.2%, followed by dyslipidemia (55.6%) and the musculoskeletal system disease (54.7%).

These data, as the statistical interpretation of them can be seen in table 1.

**Table 1.** Distribution of elderly by sex according to the presence of morbidities related to overweight. Nucleus for the Elderly Care (NEC/UFPE), Recife - Pernambuco, 2010.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Systemic Hypertension</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>146(68,2)</td>
<td>27 (65,9)</td>
<td>119(68,8)</td>
</tr>
<tr>
<td>No</td>
<td>68 (31,8)</td>
<td>14 (34,1)</td>
<td>54 (31,2)</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>67 (31,3)</td>
<td>7 (17,1)</td>
<td>60 (34,7)</td>
</tr>
<tr>
<td>No</td>
<td>147(68,7)</td>
<td>34(82,9)</td>
<td>113(65,3)</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>119(55,6)</td>
<td>18 (43,9)</td>
<td>101(58,4)</td>
</tr>
<tr>
<td>No</td>
<td>95 (44,4)</td>
<td>23 (56,1)</td>
<td>72 (41,6)</td>
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<td>Coronary Insufficiency</td>
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<tr>
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<td>16 (7,5)</td>
<td>3 (7,3)</td>
<td>13 (7,5)</td>
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<td>No</td>
<td>198(92,5)</td>
<td>38 (92,7)</td>
<td>160(92,5)</td>
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<td>Musculoskeletal system disease</td>
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<td></td>
<td></td>
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<td>Yes</td>
<td>117(54,7)</td>
<td>9 (22,0)</td>
<td>108(62,4)</td>
</tr>
<tr>
<td>No</td>
<td>97 (45,3)</td>
<td>32 (78,0)</td>
<td>65 (37,6)</td>
</tr>
<tr>
<td>Total</td>
<td>214(100)</td>
<td>41 (19,2)</td>
<td>173(80,8)</td>
</tr>
</tbody>
</table>

(1) Qui-square test of Pearson independence

The nutritional status of the elderly were classified for the purpose of analysis into two groups: the presence of overweight (BMI > 27.0 kg/m²) or absence (BMI <27.0 kg/m²).

With regard to morbidity with significant association to overweight, it was found that, among elderly patients with hypertension, 56.2% were overweight (p=0.01). And, as the DM, it was found that 62.7% were overweight (p=0.01). The other associated morbidities, without significant difference, was identified that among those who had dyslipidemia, 51.3% were overweight; among patients with coronary heart disease, 56.2% were overweight; and among those who carried the musculoskeletal system disease, in 53.0% was perceived overweight. These findings can best be observed in Table 2.
Table 2. Distribution of elderly by nutritional situation and morbidities presence. Nucleus of Elderly Care (NEC/UFPE), Recife - Pernambuco, 2010.

<table>
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<tr>
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<th>p-value</th>
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<td>146 (100)</td>
<td>64 (43,8)</td>
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<td>0,01(1)</td>
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<td>68 (100)</td>
<td>43 (63,2)</td>
<td>25 (36,8)</td>
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<tr>
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<td></td>
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<tr>
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<td>67 (100)</td>
<td>25 (37,3)</td>
<td>42 (62,7)</td>
<td>0,01(1)</td>
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<tr>
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<td>147 (100)</td>
<td>82 (55,8)</td>
<td>65 (44,2)</td>
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<tr>
<td>Dyslipidemia</td>
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<tr>
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<td>119 (100)</td>
<td>58 (48,7)</td>
<td>61 (51,3)</td>
<td>0,680(1)</td>
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<td>49 (51,6)</td>
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<td>198 (100)</td>
<td>100 (50,5)</td>
<td>98 (49,5)</td>
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<tr>
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<td>117 (100)</td>
<td>55 (47,0)</td>
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<td>97 (100)</td>
<td>52 (53,6)</td>
<td>45 (46,4)</td>
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</table>

(1) Chi-square test of Pearson independence (2) Fisher’s exact test

**DISCUSSION**

The results of this study allow to observe the prevalence of overweight in the elderly attended at Gerontological Unit and the association of this problem the presence of morbidities. It is noteworthy, however, that these results should be interpreted with caution, as the characteristics of the study population are related to the elderly clientele, belonging to a particular institution, and can not therefore, to be extended to all the elderly in the city of Recife (PE).

According to the cutoff suggested by Lipschitz, among individuals who participated in this study, the distribution of nutritional condition in terms of overweight categories, eutrophic and underweight, was similar to that found in a study in northeastern Brazil. This study aimed to identify the association of body image perception to nutritional status of elderly women. Among the interviewed elderly, these researchers found that 43.8% were eutrophic, 3.4% were in the category of underweight and 52.8% were overweight; and was also identified the prevalence of overweight among elderly in the following studies which used as a criterion for the classification of BMI, the same cutoff point used in this study: 52.4% and 47.2%.

The classification of nutritional status of the elderly should consider cutoffs superior to those for adults. This fact is based on the increased susceptibility to diseases of the elderly, and therefore required a larger reserve of fabrics for protection against malnutrition, besides the bodily changes that occur during the aging process. This proves that the classification recommended by Lipschitz should be adopted for nutritional assessment of the elderly.

As for morbidities associated with overweight, the result of this study shows prevalence of hypertension, dyslipidemia, and then the musculoskeletal system diseases. Similar results were also found by Victor et al. comorbidities, according to which 85% of elderly reported being suffering from chronic diseases. Araújo et al. found that the risk of the emergence of hypertension in the elderly is three times higher than in the young.

The upper age at 60 years for both sexes, is a risk factor associated to systemic hypertension (SH) and several other chronic diseases such as diabetes mellitus (DM) and coronary heart disease, which results in increased morbidity and mortality and impact on the health system, in addition to reducing the quality of life of elderly.

Aging has been associated to the emergence of non transmissible chronic diseases, such as diabetes, hypertension, obesity and hyperlipidemia. Such diseases arise due to the influence of several factors, among which stands out feeding.

Malnutrition has been indicated as a risk factor for mortality in elderly, more than overweight. However, obesity increases the risk of comorbidities such as hypertension, diabetes, arthritis and hyperlipidemia.

The percentage of people with hypertension may be related to other factors such as unfavorable socioeconomic conditions, low education, overweight or obesity, features present in most elderly of the study.

Related to the different categories of health variables conditions, self-perceived body image, health-related behaviors and morbidities associated with overweight and its relation to nutritional condition of overweight, it can be seen in this study that there is statistical significance only in relation to the association between overweight and the following independent variables: SH and DM (p=0.01). These findings are in agreement with the association of SH and overweight seen in other studies.
with the literature records, which highlight that overweight contributes to low self-esteem, elevated blood pressure and increased risk for diabetes mellitus). 12, 15

Diabetes and hypertension have significantly increased from BMI>27 among the studied elderly, in overweight individuals. This reveals that overweight is directly related to the emergence of non transmissible chronic diseases. 24

Obesity leads to disturbances of the health conditions of the body: social psychological disturbances, increased risk of premature death and increased risk of morbidity and mortality of major diseases such as diabetes mellitus, hypertension, hyperlipidemia, cardiovascular disease and cancer. In addition, obesity can be associated with other diseases that can affect the quality of life of obese 12 and exerts adverse influence in relation to blood pressure, glucose metabolism and blood lipids and may lead to the emergence of chronic disorders in different stages of life. Nowadays, it is a major concern for researchers. 25

CONCLUSION

The study population needs special attention, especially regarding excessive weight gain, and can identify overweight as most prevalent nutritional condition among the elderly, risk factor to the emergence of non transmissible chronic diseases, thus the realization of nutritional assessment as habitual practice in gerontological service, helps to identify individuals who are at nutritional risk, and can establish intervention programs that aim to reduce this risk.

The results of this study are suitable with data found in the national and international literature, which emphasize the importance of obesity in older people, in terms of magnitude and associated risk factors. Thus, considering the complexity of the influence of these factors, further research are needed to provide greater knowledge in this area and thus, establish monitoring practices and more targeted interventions to the needs of this population.

Therefore, it is important to establish practical monitoring of the nutritional status of assisted clients, to direct interventions increasingly responsive to the needs of nutritional condition and undertake to prevent and control obesity programs aimed at promoting health and quality of life among elderly.

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