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Original Article

Nutritional status of elderly participants of the Hiperdia system: socio-demographic characteristics and blood pressure

Estado nutricional de idosos participantes do sistema Hiperdia: características sociodemográficas e níveis pressóricos

Estado nutricional de ancianos del sistema Hiperdia: características sociodemográficas y niveles de presión

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Objective: to analyze the socio-demographic characteristics and stages of blood pressure associated to the nutritional status of elderly hypertensive patients included in the System of Registration and Monitoring of Hypertensive and Diabetic patients in a Basic Health Unit. **Methods:** cross-sectional study with primary and secondary data collection. The nutritional status was evaluated through the body mass index and analyzed, according to socio-demographic characteristics and stages of blood pressure. To analyze the data, the chi-square test was used. **Results:** 250 elderly (63.6% women) were evaluated. Statistically significant association was observed between nutritional status and gender (p=0.008), age group (p=0.05) and stage of hypertension: optimal, normal and hypertension 1. **Conclusion:** the elderly assisted by the service require constant nutritional and blood pressure re-evaluation provided by the health team.
Descriptors: Body Mass Index; Aged; Hypertension; Diabetes Mellitus; Elderly Nutrition.

Objetivo: analisar as características sociodemográficas e estágios de pressão arterial associados ao estado nutricional de idosos hipertensos, do Sistema de Cadastramento e Acompanhamento de Hipertensos e Diabéticos de uma Unidade Básica de Saúde. **Métodos:** estudo transversal, com coleta de dados primários e secundários. O estado nutricional foi avaliado por meio do índice de massa corporal e analisado, segundo características sociodemográficas e estágios de pressão arterial. Para a análise dos dados utilizou-se o teste qui-quadrado. **Resultados:** foram avaliados 250 idosos (63,6% mulheres). Associação estatisticamente significativa foi verificada entre estado nutricional e sexo (p=0,008), grupo etário (p=0,05) e estágio de hipertensão ótima, normal e hipertensão 1. **Conclusão:** os idosos assistidos pelo serviço necessitam de constante reavaliação nutricional e dos níveis pressóricos pela equipe de saúde.
Descritores: Índice de Massa Corporal; Idoso; Hipertensão; Diabetes Mellitus; Nutrição do Idoso.

Objetivo: analizar las características sociodemográficas y niveles de presión arterial asociados con el estado nutricional de ancianos hipertensos, del Sistema de Registro y Seguimiento de Hipertensos y Diabéticos de una Unidad Básica de Salud. **Métodos:** estudio transversal, con recogida de datos primarios y secundarios. El estado nutricional se evaluó mediante el índice de masa corporal y analizado, según características sociodemográficas y niveles de presión arterial. Para analizar los datos, se utilizó el test chi-cuadrado. **Resultados**: se evaluaron 250 ancianos (63,6% mujeres). Asociación estadísticamente significativa se observó entre estado nutricional y sexo (p = 0,008), grupo de edad (p = 0,05) y nivel de hipertensión óptimo, normal y hipertensión 1. **Conclusión**: los ancianos asistidos por el servicio requieren constante re-evaluación nutricional y de los niveles de presión por parte del equipo de salud.
Descriptores: Índice de Masa Corporal; Anciano; Hipertensión; Diabetes Mellitus; Nutricion del Idoso.

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Introduction

The increase number of elderly in the population is a phenomenon recognized worldwide and widely highlighted in the literature[1]. In Brazil, this growth is remarkable, considering that the number of elderly people in 2010 amounted to 14 million and the estimate for 2050 is 21 million[2]. This phenomenon is related to the reduction of fertility and mortality rates associated to the increase in the life expectancy[1-3].

Within this universe, although aging is a natural process, knowledge and understanding of the anatomical, physiological and psychological changes that occur are essential in view of the frequent changes in the conditions of health and nutrition that these alterations can cause in the patients[4].

The elderly needs to be evaluated in a wider scope. Nutritional disorders in this stage of life, such as obesity and malnutrition are frequent and require adequate follow-up[5]. It is important to ratify, however, that the nutritional alterations observed in this phase of life are not part of the natural physiological process of aging. Usually the food habit of the elderly remains similar to the one established by the habits in their youth and nutritional status continues to be appropriate, even at that stage of life in old age. Changes in nutritional status in the elderly are related to the increase of disease and disability associated to changes in lifestyle[6].

In this context, the nutritional evaluation is of utmost importance. It needs to be careful, and consider the changes in body composition, inherent to the aging process. It collaborates in the promotion, recovery and/or health maintenance, besides monitoring its evolution as well as the decline of physiological functions, dietary restrictions due to illness and the constant use of drugs[7-9].

The main causes of death worldwide are related to cardiovascular diseases, particularly hypertension[7]. Risk factors such as hyperglycemia, dyslipidemia, limitrophe blood pressure and obesity are now one of the biggest challenges to public health worldwide, especially to improve the quality of life.

In primary health care, health professionals of the Family Health Strategy team, through the National Plan of Care Reorganization to hypertension and diabetes mellitus, operate in the generation of information, registration and monitoring of hypertensive linked to the system of registration and monitoring of hypertensive and diabetic patients[7-9]. Participating in this program makes the development of health promotion policy strategies feasible, with actions in all areas, governmental or not, that impact on the quality of life of the population[10].

Aging with quality of life depends on the balance between the limitations and potentialities of the individual, these have influenced directly in the impact of changes resulting from the aging process[10]. Thus, the study was delineated from the following guiding question: What is the relationship between blood pressure levels, nutritional status and socio-demographic characteristics of the elderly members of the System of Registration and Monitoring of Hypertensive and Diabetic patients? In this sense, the objective was to examine the socio-demographic characteristics and stages of blood pressure associated to the nutritional status of elderly hypertensive patients.

Methods

The study was cross-sectional, descriptive with quantitative approach, with primary and secondary data collection. Elderly patients who are 60 years of age or older were evalutated, hypertensive patients of both genders registered in the Registration System and Monitoring of Hypertensive and Diabetic patients in a basic health unit in the city of Maringa, Parana, Brazil. The Basic Health Unit has been made available by the Health Professional Training Center.

Data collection was made from September to November 2013. The elderly participants were contacted on the days of meetings of the system, totaling eight meetings. The elderly who were absent

in the meetings were interviewed at home.

It is a study carried out in two stages: the first through the analysis of secondary data (name, address and telephone number) which are in card A of the registration of the unit. The second, by applying a semi-structured form, developed by the researchers consists of questions regarding socio-demographic characteristics: gender (male and female), age (characterized by age group: 60-69 years, 70-79 years and 80 and older) , education (categorized by years of study: without education, 1-4 years, 5-8 years, 9-11 years and 12 years or more); income (less than 1 minimum wage, 1-2 and more than two minimum wages), hypertension and associated diseases (yes or no) and hypertension time (featured in years: <1, 1-4, 5-9, 10-19 and 20 years or more).

Exclusion criteria were: the elderly incapable of performing anthropometry, such as wheelchair users or those with fractures. Data collection was performed by the researcher and nursing students of the third year, trained for this purpose. For two days training was held on the implementation of the collection instrument and on measurements of body mass index and blood pressure levels.

Nutritional status was determined by body mass index, which was obtained by the division of the weight (W) by the height (H) squared (W/H^2). Body weight was measured by the Omron® digital scale, with precision of 100 gr. The elderly were weighed standing, barefoot, with light clothing and positioned in the center of the scale with the body weight equally distributed on both feet.

Height was measured with a tape measure, 2-meter long, the Gold® brand. The tape was vertically fixed with adhesive tape on a flat wall with no skirting. The measurement was carried out with the elderly positioned standing, barefoot, with their ankles together, back straight, arms relaxed and their head positioned in the Frankfort plane (looking straight ahead at the eye height).

For the evaluation of nutritional status[11], the cutoff points used were presented by the Pan American Health Organization: underweight: BMI <23.0 kg/m^2; proper weight: body mass index between 23.0 and 28.0kg/m^2; overweight: body mass index >28.0 and ≤30.0kg/m^2; obesity: body mass index>30.0kg/m^2.

The measurement of blood pressure was made by the indirect method with the auscultatory technique with use of sphygmomanometer, duly calibrated of the Omron® brand, model HEM-781INT®. The parameters of positioning of the patients, the auscultation technique of blood pressure and the reference values complied with the recommendations of the VI Brazilian Guidelines of Hypertension[11].

To prepare the database and statistical analysis, the Statistical Package program for Social Sciences version 17.0 was used. In the inferential analysis, the chi-square test with p≤ .05 significance level was used.

The study was approved by the Committee of Ethics and Research with human beings of the Centro Universitário Censumar under Legal Opinion number 392/040. All the elderly who have agreed to participate in the study signed the Informed Consent Form.

Results

Of the 250 elderly studied, 63.6% were female, with a predominance of the age group between 60 and 69 years (48.4%). The average age was 70.8±7.2 years and 70.3±7.4 years for females and 71.8±6.8 years for males. Regarding the education, it was found that 39.6% of the elderly interviewed reported having between one and four years of study. In relation to hypertension and related diseases, it was found that most (59.2%) reported to have another disease. As for the time of hypertension (41.0%) of the elderly reported having the disease for five to nine years (Table 1).

Table 1 - Socio-demographic characteristics, income, time of hypertension, hypertension and related diseases of the hypertensive elderly participants of the Hiperdia system

Variables	n (%)
Gender	
Female	159 (63.6)
Male	91 (36.4)
Age (years)	
60 – 69	121 (48.4)
70 – 79	889 (35.2)
≥ 80	41 (16.4)
Education (years)	
No education	13 (5.2)
1 – 4	99 (39.6)
5 – 8	91 (36.4)
9 – 11	43 (17.2)
≥ 12	4 (1.6)
hypertsion and related diseases	
Yes	1489 (59.2)
No	102 (40.8)
Time of hypertension (years)	
< 1	7 (3.1)
1 – 4	45 (19.7)
5 – 9	94 (41.0)
10 – 19	70 (30.6)
≥ 20	13 (5.7)
Did not know the answer	21 (8.4)

In Table 2, there is the distribution of hypertensive elderly patients between nutritional status and gender. Statistically significant association was observed between nutritional status and gender, the appropriate weight percentage is higher in males (53.8%>35.8%). But the percentage of obesity was higher (34.0%) among women.

Table 2 - Distribution of hypertensive elderly participants of the Hiperdia system, according to nutritional status and gender

Nutritional status	Gender		
	Male n (%)	Female n (%)	Total n (%)
Low weight	9 (9.9)	14 (8.8)	23 (9.2)
Adequate weight	49 (53.8)	57 (35.8)	106 (42.4)
Overweight	19 (20.9)	34 (21.4)	53 (21.2)
Obesity	14 (15.4)	54 (34.0)	68 (27.7)
Total	91 (100.0)	159 (100.0)	250 (100.0)

χ^2 test; p = 0.008

Statistically significant association (p=0.05) was found between nutritional status and age. This result is probably related both to the lowest percentage (12.5% and 17.0%) of elderly of the age groups between 70 and 79 years and 80 years or more, respectively, which were underweight, about the highest percentage (34.5%) among the elderly in the age group between 60 and 69 who were obese. Other data related to nutritional status and age group are shown in Table 3.

Table 3 - Distribution of hypertensive elderly participants of the Hiperdia system, according to nutritional status and age group

Nutritional status	Age group (years)			
	60 – 69 n (%)	70 – 79 n (%)	≥80 n (%)	Total n (%)
Low weight	5 (4.1)	11 (12.5)	7 (17.0)	23 (9.2)
Adequate weight	48 (39.7)	41 (46.5)	17 (41.5)	106 (42.4)
Overweight	26 (21.5)	18 (20.5)	9 (22.0)	53 (21.2)
Obesity	42 (34.7)	18 (20.5)	8 (19.5)	68 (27.2)
Total	121(100.0)	88(100.0)	41(100.0)	250(100.0)

χ^2 test; p = 0.05

As to education, even though statistical association between this variable and the nutritional status was not found, the elderly without schooling had the highest proportion (69.2%) of elderly with adequate nutritional status. The underweight was higher among those elderly with one to four years of study. Similar proportions of overweight were observed in groups with one to four years and five to eight years of study, corresponding to 21.2% and 22.0%, respectively. Obesity was found in greater proportion (39.5%) among those elderly with nine to 11 years of study (Table 4).

Table 4 - Distribution of hypertensive elderly participants of the Hiperdia system, according to nutritional status and education (years)

Nutritional status	Education (years)					
	No education n (%)	1 – 4 n (%)	5 – 8 n (%)	9 – 11 n (%)	≥12 n (%)	Total n (%)
Low weight	-	13 (13.1)	9 (9.9)	1 (2.3)	-	23 (9.2)
Adequate weight	9 (69.2)	35 (35.4)	43(47.3)	17(39.5)	2 (50.0)	106 (42.4)
Overweight	3 (23.1)	21 (21.2)	20 (22.0)	8 (18.6)	1 (25.0)	53(21.2)
Obesity	1 (7.7)	30 (30.3)	19 (20.9)	17 (39.5)	1 (25.0)	68(27.2)
Total	13(100.0)	99(100.0)	91(100.0)	43(100.0)	4(100.0)	250(100.0)

The average systolic blood pressure of the elderly was 127.5±17.5 mmHg and diastolic 77.5±13.8 mmHg. The minimum systolic blood pressure was 85 mmHg and 192 mmHg maximum; the minimum diastolic blood pressure was 40 mmHg and 113 mmHg maximum.

Regarding the distribution of elderly participants of the Hiperdia system, according to nutritional status and stages of blood pressure, it was found that the overweight elderly had a higher proportion (39.6%) of elderly patients with hypertension stage 1. The elderly with low weight presented 39.1% of the patients with normal blood pressure.

In Table 5, the percentage of optimal blood pressure found is significantly higher in the obese group compared to the group of overweight (33.8%> 17.0%); the percentage of normal blood pressure is significantly higher in the groups with low weight and adequate weight in relation to the obese group (39.1% and 29.2%> 10.3%); the percentage of hypertension 1 is significantly higher in the overweight group compared to the adequate weight group (39.6%> 18.9%).

Table 5 - Distribution of hypertensive elderly participants of the Hiperdia system, according to nutritional status and stages of blood pressure

Blood pressure	Nutritional status				
	Low weight n (%)	Adequate weight n (%)	Overweight n (%)	Obesity n (%)	Total n (%)
Optimal	5 (21.7)	21 (19.8)	9 (17.0)	23 (33.8)	58 (23.2)
Normal	9 (39.1)	31 (29.2)	10 (18.9)	7 (10.3)	57 (22.8)
limitrophe	1 (4.5)	23 (21.7)	6 (11.3)	139 (19.1)	43 (17.2)
Hypertension 1	7 (30.4)	20 (18.9)	21 (39.6)	18 (26.5)	66 (26.4)
Hypertension 2	-	9 (8.5)	6 (11.3)	4 (5.9)	19 (7.6)
Hypertension 3	1 (4.3)	2 (1.9)	1 (1.9)	3 (4.4)	7 (2.8)
Total	23(100.0)	106(100.0)	53(100.0)	68(100.0)	250(100.0)

χ^2 test; p=0.01

Discussion

Aging is discussed worldwide with a view to the increase of the number of subjects who reach older ages. A recent publication on the elderly population made by the United Nations estimates that the elderly population will reach 22.0% by 2050[12].

In Brazil, the estimate of the Brazilian Institute of Geography and Statistics is that in 2060, the elderly should reach 26.8% of the population. In Paraná, the life expectancy will jump to 80 years of age, in 2028, and the proportion of elderly will grow from the current 7.9% to 15.1% in 2030[2].

The superiority (63.6%) of hypertensive women found in this study was also observed in another publication with users of the System of

Registration and Monitoring of Hypertensive and Diabetic patients[11]. A research made through the telephone by the system of surveillance of factors of risk and protection for non-communicable chronic diseases between 2006 and 2013 reported that 26.3% of hypertensive elderly patients are women[12].

The predominance of women is related to higher male mortality. This phenomenon, although common to all age groups was evident in the elderly group, since a smaller number of men than women, can reach higher ages[2].

The preeminence of women may indicate greater spontaneous demand for care and/or more access to health services than men, and a possible explanation for the fact that a greater number of women registered in the System of Registration and Monitoring of Hypertensive and Diabetic patients.

The age group highlighted in this study was between 60 and 69 years (48.4%) of age. Similar findings were reported in the study on the socio-demographic profile and functional evaluation of elderly patients assisted by a family health team on the outskirts of Goiania, where the percentage of elderly in the same age group accounted for 57.5%[13].

In reference to education, 39.6% of the interviewees had study time less than four years. In Brazil, subjects with low education have greater exposure to factors of risk for cardiovascular diseases, including the development of hypertension, than those with higher education, keeping in mind that it may interfere indirectly in the assimilation of the necessary information to the treatment[14].

Regarding the individual income (49.2%) of the elderly had incomes less than twice the minimum wage. The low socioeconomic status is also identified as a factor that hinders the effective control of blood pressure and nutritional status[15].

Concerning the time of hypertension, 41.0% of the elderly had the time of the disease between one and five years. Unlike the present study, the research conducted in theHiperdia system in Teresina, Piauí, Brazil, found that the time of the disease was on average nine years[16].

Regarding the hypertension and related diseases, most of the elderly (59.2%) had an associated disease. Diabetes mellitus was the co-morbidity associated to most hypertensive elderly (52.7%). Antihypertensive drugs may aggravate this situation, making the hypertensive more apt to develop diabetes mellitus. Similar to what was found in the study of hypertensive elderly patients which presented the percentage of 98.3%, 25% of those elderly had associated diabetes mellitus[17].

In relation to nutritional status, it was found that the males had the highest percentage (53.8%) of the elderly with adequate weight. The obesity was more frequent in females, corresponding to 34.0%. A possible explanation can be the biological aspect, as they tend to accumulate more subcutaneous fat[18], similar to that observed in the study, where a greater proportion of overweight among elderly females and lower prevalence of underweight in the research on the nutritional status using the body mass index[18]

Regarding the nutritional status and hypertension, it has been found that the elderly studied with a percentage of obesity (33.8%) showed optimal blood pressure. In 39.1% of the cases, the elderly with low weight had their blood pressure normal, 39.6% of the elderly with hypertension 1 were overweight. The findings on overweight and obesity-related hypertension indicate that the nutritional weight changes are directly linked to the prevalence of hypertension from young ages into adulthood[19].

In the study on the prevalence of overweight and blood pressure in the elderly, 44.4% of the obese elderly presented hypertension. Among the elderly with adequate weight, 40% had severe hypertension and those with obesity II, 100% had mild hypertension. A similar result was found in the study of the anthropometric assessment of elderly participants of the program University Open to the Third Age, in which 52.17% of the women were overweight[19].

Some limitations are considered in this study as the particular nature of the sample of individuals, that is, a citizen of the county of Maringa, Parana, which in turn limits the extrapolation of the observed data.

Conclusion

The data presented on the nutritional status of the elderly population being monitored in the System of Registration and Monitoring of Hypertensive and Diabetic patients of a Basic Health Unit indicated that a high percentage of elderly presented adequate weight, being more prevalent in males and the elderly aged 70-79 years.

The results indicate the need for action to improve the nutritional status of the elderly, although the Brazilian legislation concerning the the population older than 60 years is advanced.

Collaborations

Mincoff RCL contributed to the conception, collection of field data, analysis, data interpretation and writing of the article. Bennemann RM and Martins MC contributed to the conception and final approval of the version to be published.

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