

Diet Quality and Nutritional Status in Southern Brazilian Oldest Old

Flavia Picoli Gheno*, Maria Marina Serrao Cabral, Claudine Lamanna Schirmer, Loiva Beatriz Dallepiane and Angelo Jose Goncalves Bos

Graduate Program in Biomedical Gerontology, Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil

*Corresponding Author: Flavia Picoli Gheno, Graduate Program in Biomedical Gerontology, Pontifical Catholic University of Rio Grande do Sul, Porto Alegre, RS, Brazil.

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Abstract

Objective: To evaluate the possible relationship between diet quality and nutritional status of the oldest old.

Methods: The study was conducted in March 2015, in home visits to oldest old participants (80 years or older), living in a northern city of Rio Grande do Sul. We excluded participants who were bedridden. Nutritional status was assessed using the Mini Nutritional Assessment (MNA) and Quality of the Diet through the Questionnaire of the Food Guide for the Brazilian Population (QFGBP). The relationship between MNA and QFGBP were tested by linear regression including possible confounding factors (sociodemographic and clinical).

Results: The sample consisted of 20 oldest olds, 16 (80%) were female with a mean age of 84.0 ± 3.36 years. The average of QFGBP scores was not significantly different in sociodemographic or clinical levels, on the other hand, education showed significant differences at MNA score ($p = 0.007$) and indicative of significance to self-related health ($p = 0.054$). In linear regression questionnaire was significantly associated with MNA even in the presence of the education level and self-related health. Higher scores of QFGBP was significantly associated to higher levels of MNA (0.011).

Conclusion: The diet quality was positively correlated with nutritional status even adjusting for sociodemographic and clinical factors in the oldest old.

Keywords: Oldest old (80+); Feeding; Eating habits; Nutritional assessment; Nutrition of the elderly

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Introduction

Accelerated world aging population is leading to an increase in the incidence of chronic diseases and disabilities increasing in the demand for health services, including nutritional assessment and approach. The fastest growing age group is those aged 80 years or older, also called oldest-old [1]. Thus, it is essential to characterize of food patterns and the influence of inadequate nutritional status of the oldest-old [2].

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Investigating the dietary habits can yield good intervention strategies appropriate to this age group [3]. These strategies are essential for directing public policies focused on food and nutrition. The Brazilian epidemiological status demonstrates the need for changes and new models of health care of the oldest-old, with proposals of different actions for the health system [4].

It is known that eating habits play a very important role in longevity [5]. Studies in developed countries with centenarians show that throughout life, healthy eating has contributed to a longer and healthier life [6]. Different populations and cultures have different eating habits. Investigating the quality of the diet of the Brazilian oldest-old can help to examine the country food patterns that are related to maintaining a good health status.

However, few studies investigate the relationship between dietary or nutrient patterns and socio-demographic characteristics or nutritional quality of the diet in oldest-old subject. In this way the present research focused on the evaluation of the quality of the diet and the nutritional status of oldest-old.

Methods

This is a cross-sectional study. The sample consisted of 20 elderly people (80 years or older) enrolled in a Primary Care Service with Family Health Strategy in the city of Palmeira das Missões, RS. Since it was difficult to evaluate the nutrition status, participants who were bedridden were excluded. Data collection was done at the participants' home in March 2015.

Assessment of nutritional status

The nutritional status was evaluated through the Mini Nutritional Assessment (MAN) [7], which is a practical and non-invasive validated instrument developed by Nestlé. It considers the nutritional state of health, the fragility and eventual illnesses that affect the elderly, and also identifies those who have the need for dietary therapy [8]. The instrument includes anthropometric assessments (Body Mass Index, arm circumference, calf circumference and weight loss) and a global, dietary and self-assessment component, which encompasses self-perception of health. Considering the sum of MAN scores it classifies nutritional status as: malnourished (< 17 points), in risk of malnutrition (between 17 and 23.5 points) and as having adequate nutritional status (≥ 24 points) [9].

Evaluation of the quality of the diet

The Food Guide for the Brazilian Population Questionnaire (FGBPQ) uses the "Ten Steps to a Healthy Diet" [10]. Composed by 18 questions it evaluates the adequate consumption of breads and cereals, fruits, vegetables, meats, milk and dairy products, sweets, fried foods, salt and water. The answers resulted in a score allowing the classification of the diet as good, intermediate or poor [11]. For purposes of statistical analysis, the quality of the diet was used with its numerical value.

Statistical Analysis

Epi Info software version 7.1.5 was used. The means of the scores obtained in the level of quality of the diet and total of the MAN were calculated and compared with the independent variables (gender, age group, skin color, level of schooling, marital status, occupation, self-perception of health and presence Chronic diseases) Possible differences were tested by t-Student or ANOVA. The independent variables that obtained a level of significance of less than 10% in the simple analysis were included in an initial linear regression model, with the independent variable being the total score of the MAN and the quality level of the diet as a dependent variable. The systematic withdrawal of the least significant factors resulted in a final model with all independent variables significantly predictive of the total score of MAN. Statistical tests were considered statistically significant at $p < 0.05$ and trend of significance a p between 0.05 and 0.10 [12].

Ethical Aspects

Each participant of the research received the Informed Consent Term, which informed the purposes of the study, with all the procedures adopted, through a language easy to understand and accessible. The informed consent also clarified that the study was voluntary

and the participant could abandon it at any time without causing him or her any harm. The Research Ethics Committee (IRB) of University approved this Project, with a protocol number 06838612.8.0000.5336.

Results

A total of 20 elderly people participated in the study. Table 1 shows the sociodemographic profile of the participants related to independent variables that influence the quality of the diet. Among the participants 16 (80%) were female with a mean age of 84.0 ± 3.36 years, ranging in age from 80 to 91 y.o. Eight (40%) of the participants presented cognitive decline. The most frequent chronic disease among the participants were: Hypertension (80%), visual problems (55%), Heart Disease (50%), Osteoarthritis (50%), Anxiety (20%) and Depression (15%). Dietary quality averages were not significantly different at different sociodemographic or clinical levels.

Sociodemographic Profile	N	Mean	SD	P
Gender				
Female	16	32.9	4.6	0.808
Male	4	32.2	6.3	
Age group				
< 85 years old	12	33.6	4.2	0.343
≥ 85 years old	8	31.5	5.7	
Skin color				
White	13	33.0	4.9	0.739
Mestizo	7	32.2	5.0	
Education				
Illiterate	4	31.7	4.1	0.360
Elementary incomplete	8	31.3	5.2	
Elementary or higher	8	34.7	4.7	
Marital status				
Married	5	31	5.4	0.354
Widowed	15	33.4	4.7	
Occupation				
Household	14	33	4.8	0.787
Other	6	32.3	5.4	
Nutrition status				
Normal	14	33.5	5.3	0.339
Nutritional risk	6	31.1	3.5	
Self-perception of health				
Bad or worst	6	32.8	6.7	0.984
Regular or good	14	32.7	4.1	

N = Sample number

DP = Standard deviation

P = Significance level

Table 1: Quality levels of the diet according to the sociodemographic and clinical profile of the participants. Rio Grande do Sul, Brazil, 2015 (N = 20).

Table 2 presents the differences in the MAN scores related to sociodemographic and clinical variables. The differences in the means of the MAN total score were statistically different among the educational levels ($p = 0.007$). Illiterate participants had lower MAN scores than the other two levels. Participants with poor or worst self-perception of health had better levels of MAN, and this difference reached the level a significant trend ($p = 0.054$)

Sociodemographic Profile	N	Mean	SD	P
Gender				
Female	16	25.1	3.0	0.412
Male	4	26.5	0.8	
Age group				
< 85	12	25.7	3.0	
≥ 85	8	25.0	2.4	0.628
Skin color				
White	13	25.7	2.5	0.492
Mestizo	7	24.8	3.2	
Education				
Illiterate	4	21.9	0.7	0.007
Incomplete elementary	8	26.1	1.2	
Elementary or higher	8	26.5	3.1	
Marital status				
Married	5	25.3	1.4	0.889
Widowed	15	25.5	3.1	
Occupation				
Housewife	14	24.7	2.7	0.102
Other	6	27	2.1	
Quality of Diet				
Intermediate	16	25.9	2.8	0.115
Bad	4	23.5	1.5	
Self-perception of health				
Bad or worst	6	27.2	2.8	0.054
Regular or good	14	24.6	2.4	

N = Sample number

DP = Standard deviation

P = Significance level

Table 2: Distribution of the mean values of the Mini Nutritional Assessment related to sociodemographic variables, diet quality and self-perception of health. Rio Grande do Sul, Brazil, 2015 (N = 20).

The variables of interest that were significant or with a trend level of significance were included in an initial linear regression model, using the MAN total score as the dependent variable. For the final model all non-significant variables of the initial model were removed. As a result, it was observed that the health self-perception was not significant in the initial model, leaving only the variables FGBPQ and education level for the final model. Higher diet quality level was significantly associated ($p = 0.0113$) with a higher MAN score, even when adjusted for education level. This, in turn, has also been shown to be significantly associated with MAN's overall score.

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Participants with incomplete elementary and elementary or higher school level showed significantly higher levels of MAN. Figure 1 shows the scatter graph of the diet quality index and the total score of MAN, presenting a positive and significant relationship.

	Initial Model		Final Model	
	Coefficient	P	Coefficient	P
Diet Quality Index	0.226	0.0404	0.262	0.0113
Education (illiterate)				
Incomplete elementary	3.764	0.0287	4.323	0.0014
Elementary or higher	3.665	0.0268	3.876	0.0040
SPH (bad or worst)				
Fair or good	-1.809	0.1027		

SPH = self-perception of health;

N = sample number

P = significance level

Table 3: Initial and final multiple linear regressions models for the association of the total score of the Mini Nutritional Assessment. Rio Grande do Sul, Brazil, 2015 (N = 20).

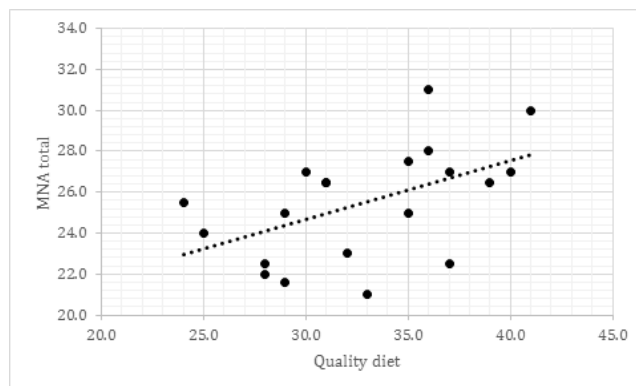


Figure 1: Dispersion of the results of the Diet Quality Index and the Total Score of the Mini Nutritional Assessment (Total MAN) ($r^2 = 0.26$, $p = 0.0229$).

Discussion

In this study, the majority of the oldest-old (80%) presented an intermediate dietary pattern according to the parameters of the FGBPQ adopted by the Brazilian Ministry of Health, which characterizes as intermediate the quality of the diet between 29 and 42 points [10]. Similar to this, a research on United Kingdom oldest-old, shows a moderate quality of diet in most of its participants [13]. Unfortunately, biochemical parameters of nutrition such serum albumin, vitamin levels and hemoglobin were not available.

Healthy eating has been linked to lower incidence of cancer, diabetes, cardiovascular and Alzheimer’s diseases, whereas inadequate diets have been associated with increased risk [14]. Another Brazilian study evaluating the diet in oldest-old showed that most of them had adequate dietary patterns [15]. This result was similar to our study, which showed normal nutritional status in most of the oldest-old (70%). Colembergue & Conde [16] evaluated nutritional status using MAN and found that more than half of the elderly were well nourished and only 10.7% were malnourished.

Our results suggest that the educational level may play an important role in feeding, since a significant association between better quality of the diet and higher scores of MAN when adjusted for education level ($p = 0.0113$). Other studies also observed a strong association between education level and healthy eating pattern [14]. According to Wardle, *et al.* [17], people with higher levels of education may have better nutritional knowledge, allowing them to make more healthy choices.

Socio-demographic factors such as age, gender, socioeconomic status, and lifestyle influence dietary patterns and nutrition [18]. Despite not having a significant association, younger age groups (< 85 years), whites and widowers presented a better quality of the diet. The association between food intake and sociodemographic characteristics suggests that food choices are related to a healthier lifestyle [19].

In our study, diet quality was not significantly different in sociodemographic, clinical or self-perceived health characteristics. Data similar to those found by Hsiao, *et al.* [19], although not significantly associated, those who reported having good health were more prone to a “healthier” eating pattern.

Because this research is a sample of oldest-old, those evaluated may have memory impairment, restricting the ability to recall food intake. In addition, the questionnaire used to evaluate eating habits of these individuals has not yet been validated. For these reasons, there is a need for validated methods for the evaluation of the food pattern of oldest-old populations.

Conclusion

The quality of the diet had no significant relation with socio-demographic factors, whereas the MAN had a significant relation with schooling and self-perception of health. We observed a strong correlation between diet quality and the nutritional status of the researched individuals. It is noteworthy that most of the oldest-old had an intermediate eating pattern. These results suggest a need for an improvement in oldest-old diet quality. Further longitudinal surveys should investigate changes in eating patterns and their association with health and longevity.

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