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Dietary habits of older adults: a comparison between two distinct regions of Brazil (Southern and Northeastern)

Hábito alimentar de idosos: comparação entre duas regiões distintas do Brasil (sul e nordeste)

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ABSTRACT

Objective: To identify the differences in the dietary habits of older adults from two cities of distinct regions of Brazil and to analyze the socio-demographic factors associated with adequate dietary habit.

Method: Cross-sectional study, population-based household survey. A total of 793 persons (≥60 years) from southern and northeastern regions were evaluated. The dietary habits was obtained by daily consumption of milk, cheese or other dairy products; consumption of eggs, beans or pulses (once a week); consumption of meat, fish or poultry (3 times/week); consumption of vegetables, grains and fruits (4 times or more/week); number of glasses or cups of fluid ingested (>5 cups/day). The adequate dietary habit (principle category of analysis) were ranked when there was reference to the consumption of all the food groups.

Results: Older adults from the southern region showed a greater consumption of most food group (except the consumption of eggs, beans or lentils) and rate of adequate dietary habits than older adults from the northeast. The Poisson regression models showed that the potential socio-demographic determinants of adequate dietary habits were younger subjects (southern) and higher schooling (in both municipalities).

Discussion: These factors suggest the existence of a relationship between lower adequacy in dietary habits and poorer socioeconomic indicators. The socio-demographic inequalities in Brazil still affect dietary habits.

Conclusion: Older adults from regions with better socio-demographic indicators are more likely to present a higher prevalence in consumption of the investigated food. Literacy stands out as a potential indicator of adequate dietary habits for older adults, regardless of the region investigated.

KEYWORDS

Aged, Diet, Socioeconomic Factors, Cross-Sectional Studies.

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RESUMO

Objetivo: Verificar as diferenças nos hábitos alimentares entre os idosos de duas cidades de regiões distintas do Brasil e os fatores sociodemográficos associados ao hábito alimentar adequado.

Método: Estudo transversal, populacional de base domiciliar. Foram entrevistados 793 idosos (≥ 60 anos) das regiões sul e nordeste. O hábito alimentar foi verificado por meio de questões relacionadas à frequência alimentar: consumo diário de leite, queijo ou outros produtos lácteos; consumo de ovos, feijão ou leguminosas (1vez/ semana); consumo de carne, peixe ou aves (3 vezes / semana); consumo de verduras, legumes e frutas (4 vezes ou +/semana); número de copos ou xícaras de líquido ingeridos (>5 copos/dia). Foi considerado hábito alimentar adequado (categoria principal de análise) quando houve referência à ingestão de todos os grupos de alimentos.

Resultados: A prevalência do consumo da maioria dos grupos de alimentos (exceto o consumo de ovos, feijão ou lentilhas) e do hábito alimentar adequado foi maior entre os idosos do sul. Os modelos de regressão de Poisson permitiram identificar que a menor idade (no sul) e a melhor escolaridade (ambos os municípios) foram os potenciais determinantes sociodemográficos do hábito alimentar adequado.

Discussão: Os resultados reforçam a ideia de que diferentes contextos socioeconômicos, ambientais e culturais podem ter influência direta sobre os hábitos alimentares de diferentes populações. As desigualdades sociodemográficas do Brasil ainda afetam o hábito alimentar.

Conclusão: Idosos de região com melhores indicadores sociodemográficos são mais propensos a apresentar maior prevalência no consumo dos alimentos investigados. O fato de saber ler e escrever destaca-se como potencial indicador do hábito alimentar adequado nos idosos, independente da região investigada.

DESCRITORES

Idoso, Dieta, Fatores socioeconômicos, Estudos transversais.

ABBREVIATIONS

AC-SC: Antônio Carlos, Santa Catarina.

LC-BA: Lafaiete Coutinho, Bahia.

INTRODUCTION

Dietary habits are determined by income, prices, individual preferences and beliefs, as well as the physical, socioeconomic and cultural environment[1]. Older adults may be more susceptible to arising complications in dietary habits. There are adverse social and psychological factors (poverty, isolation, difficulty in purchasing and preparing meals, cognitive decline, depression etc.)[2] that can affect the nutritional characteristics of older population.

In Brazil, a country of continental dimensions, there are great cultural, environmental and socioeconomic diversity between regions[3,4]. Despite the current Brazilian public policy to reduce poverty and inequalities, Brazil still shows socioeconomic disparities, particularly in relation to the southern and northeastern regions. The social, economic and health aspects of the southern regions are superior, whereas concerns about food availability are greater in the northeastern region[5,6]. It is believed that these differing aspects can be reflected in the dietary habits of older adults living in these regions. In this way, carrying out research that compares dietary habits of older people living in different regions of the country are fundamental. The researches can contribute to public health policies strategies aimed to the demands of each region[7].

Therefore, the objective of this study was to identify the differences in the dietary habits of older adult residents in two cities of distinct regions of Brazil and to analyze the sociodemographic factors associated with adequate dietary habits of the elderly from each city.

METHODS

This cross-sectional study uses data from two epidemiological studies that are population and household based, one was carried out in Antônio Carlos (AC-SC), Santa Catarina state, southern Brazil (*"Effectiveness of health policies, physical activity and nutrition of the elderly from the municipality of Antônio Carlos, Santa Catarina"*). The other study was conducted in Lafaiete Coutinho (LC-BA), Bahia state, northeast (*"Nutritional status, risk associated behavior and health conditions of the elderly from Lafaiete Coutinho-Bahia"*) The characteristics of the two locations, as well as the sampling procedures were previously published[8] and will be presented concisely.

In AC-SC, the study population consisted of all people aged ≥ 60 years (rural and urban areas) enrolled in

the Family Health Program - FHP (n = 917) in 2009. The aim of this program is to increase people's access to primary health care and it covers all county[8]. For those aged 60-79 years (n = 782), the estimated sample (stratified by the three areas of the FHP) consisted of 343 older adults (error margin of 5.4%, prevalence with an unknown outcome of 50%, test power of 80% and sample loss of 15%). We decided to interview all older people aged 80 years or above (n = 134). Since the stratified sample was not proportional, we used sample weights in the analysis of data. Data were collected in 2010/2011.

In LC-BA, a census was carried out that identified 355 older people (≥ 60 years) living in the urban area of the municipality. The identification of the housing was performed with aid of FHP. Of the 355 older adults who comprised the population, 316 (89.0%) participated in the survey. Data were collected in 2011.

In both municipalities, the criteria for sample loss included: individual were not located after three home visits on alternate days; absence of proxy respondent when needed, and inability to access the residence due to the poor conditions of rural roads (only AC-SC).

Personal face to face interviews were conducted using a form based on the questionnaire used in the SABE survey ("Health, Well-Being and Aging"), which was carried out in São Paulo-Brazil, as well as six other Latin American and Caribbean countries. This questionnaire contains a number of conventional validated instruments[9]. The interviewers were previously trained for the testing of the instrument. Cognitive function was verified with a modified Mini-Mental State Examination[10] and subjects with scores less than 13 were also asked to answer questions related to the Pfeffer Scale of Functional Capacity[11] (6 or more; altered). If the participant presented cognitive impairment, the assistance of a proxy respondent was required.

Dietary habits were verified using questions relating to the food frequency of the following food groups[12]: a) daily consumption of milk, cheese or other dairy products (yes/no); b) consumption of eggs, beans or lentils (pulses), at least once a week (yes/no); c) consumption of meat, fish or poultry at least three times a week (yes/no); d) consumption of vegetables, pulses and fruits four times or more per week (yes/no); e) number of glasses or cups of fluid ingested per day, recorded in groups of, up to five cups and more than five cups. The adequate dietary habits (main category for analysis) were ranked when there was reference to the consumption of all the food groups[12].

The explanatory variables were: sex, age group (60-69, 70-79 and ≥ 80 years), schooling (literate, illiterate), marital status (with partner/without partner), family living status (alone/accompanied) and current occupation (yes/no). Data from body mass, body mass index (≤ 22 kg/m², underweight; and ≥ 27 kg/m², overweight)[13] was used for descriptive characteristics of study population. Details of the procedures for taking anthropometric measurements were previously published[8].

The database and the analyses were performed using the SPSS statistical program (version 16.0). The Chi-square test (5% significance level) compared the adequate dietary habits between the municipalities.

Crude prevalence ratios (PR) and 95% confidence intervals (95%CI) were calculated using Poisson's regression. Adjusted analysis was then carried out. All variables were adjusted for the analysis regardless of the *p* value (Wald test) obtained in the crude analysis. We used Poisson regression with backward selection and the proposed model consisted of two levels: 1st level, sex and age group; 2nd level, marital status, education, employment status and family living status. The variables that presented a *p* value of <0.20 in the 1st level, remained set at the same level and remained set at the 2nd level. Second level variables that showed a *p* value <0.20 remained in the final analysis model. Variables with a p value < 0.05 were considered associated with adequate dietary habits.

The analysis (AC-SC) was weighted by the post-stratification weight, resulting from the sampling method.

The study was carried out in accordance with the World Medical Association's Declaration of Helsinki and the ethics committees of the Universidade Federal de Santa Catarina (process No. 189/09) and at the Universidade Estadual do Sudoeste da Bahia (process No. 064/10) approved the research. Participation was voluntary, and a signed informed consent form was obtained.

RESULTS

According to Table 1, there was no difference in the proportion of men and women between the two locations. The proportion of older adults in the younger age group, who still worked, had a partner and were literate, were higher among older adults from AC-SC, compared to LC-BA.

Table 1. Distribution (%) of the older adults according to the socio-demographic characteristics and body mass index.

	AC-SC		LC-BA		p*
	n	%	n	%	
Sex					0.54
Female	270	56.8	173	54.9	
Male	207	43.2	143	45.1	
Age group (years)					<0.001
60 to 69	197	49.5	115	36.5	
70 to 79	146	35.8	106	33.7	
≥80	134	14.7	94	29.8	
Marital Status					<0.001
With partner	355	75.3	179	56.6	
Without partner	118	24.7	137	43.4	
Current Occupation					<0.001
Yes	204	43.4	35	11.4	
No	266	56.6	273	88.6	
Literacy					<0.001
Literate	394	82.5	105	33.2	
Illiterate	83	17.5	211	66.8	
Living arrangement					0.14
Alone	65	13.6	52	16.5	
Accompanied	412	86.4	264	83.5	
Body mass index					<0.001
≤ 22 kg/m^2	38	8.2	87	28.2	
>22 and <27 kg/m^2	182	39.0	132	42.9	
≥ 27 kg/m^2	246	52.8	89	28.9	

AC-SC, Antônio Carlos, Santa Catarina.
LC-BA, Lafaiete Coutinho, Bahia.
*chi-square test (χ^2).

The older adults from AC-SC showed greater prevalence to adequate dietary habits, as well as to the specific food groups, except in relation to the consumption of eggs, beans or lentils (pulses), which did not show any significant difference (Table 2).

The older adults from LC-BA had the lowest proportions of adequate dietary habits, according almost all socio-demographic variables (Table 3).

Tables 4 and 5 present the crude and adjusted analysis of the association between adequate dietary habits and sociodemographic variables, for older adults of AC-SC and LC-BA, respectively. The adjusted analysis showed that the adequate dietary habit was inverse and independently associated with age and literacy. Older adults aged from 70 to 79 years and ≥80 years, showed a lower prevalence (21% and 39%, respectively) of adequate dietary habits compared to those aged 60 to 69 years. Illiterate individuals showed a 38% lower prevalence for adequate dietary habits, compared to that of their peers. (Table 4). In relation to older adults from LC-BA (Table 5) the crude and adjusted analyses showed less prevalence

Table 2. Comparison of indicators of adequate dietary habits among older adults from Antônio Carlos (AC-SC) and Lafaiete Coutinho (LC-BA).

Variables	AC-SC		LC-BA		p*
	n	%	n	%	
Consumption of vegetables. fruits and vegetables (4 or more times / week)	475	77.6	312	71.5	0.03
Consumption of meat, fish ou poultry at least 3 times /week	476	98.7	312	90.7	<0.001
Daily consumption of milk, cheese or other dairy products	476	86.3	312	65.7	<0.001
Consumption of more than 5 cups or cups of fluid a day	473	60.0	311	48.9	0.001
Consumption of eggs, beans or lentils (pulses), at least once / week	476	95.7	312	95.5	0.88
Adequate dietary pattern	470	40.9	311	21.9	<0.001

AC-SC, Antônio Carlos, Santa Catarina.
LC-BA, Lafaiete Coutinho, Bahia.
*chi-square test (χ^2).

Table 3. Comparison of indicators of adequate dietary habits of older adults from Antônio Carlos (AC-SC) and Lafaiete Coutinho (LC-BA), according to socio-demographic variables.

Variáveis	AC-SC		LC-BA		p*
	n	%	n	%	
Sex					
Female	267	41.9	171	21.1	<0.001
Male	203	39.4	140	22.9	<0.001
Age group (years)					
60 to 69	197	46.9	114	24.6	<0.001
70 to 79	144	37.2	104	21.2	0.003
≥80	129	28.7	92	19.6	0.12
Marital Status					
With partner	355	43.8	135	25.0	<0.001
Without partner	115	43.8	135	25.0	<0.001
Current Occupation					
Yes	177	46.6	35	25.7	0.02
No	99	37.4	57	21.1	<0.001
Schooling					
Literate	387	43.7	104	34.6	0.08
Illiterate	82	28.0	207	15.5	0.003
Living arrangement					
Alone	63	33.9	49	22.4	0.14
Accompanied	407	41.9	262	21.8	<0.001

AC-SC, Antônio Carlos, Santa Catarina.
LC-BA, Lafaiete Coutinho, Bahia.
*chi-square test (χ^2).

Table 4. Crude and adjusted analysis of the association between the adequate dietary habits and socio-demographic variables in older adults from Antônio Carlos (AC-SC).

Variables	Crude analysis		Adjusted analysis*	
	PR (95% IC)	p	PR (95% IC)	p
Sex[a]		0.54†		0.63†
Female	1.00		1.00	
Male	0.95 (0.81; 1.11)		0.96 (0.82; 1.12)	
Age group (years)[a]		<0.001‡		<0.001‡
60 to 69	1.00		1.00	
70 to 79	0.79 (0.67; 0.94)		0.79 (0.67; 0.94)	
≥80	0.61 (0.46; 0.81)		0.61 (0.46; 0.81)	
Marital Status[b]		0.49†		0.33†
With partner	1.00		1.00	
Without partner	0.94 (0.77; 1.13)		1.13 (0.89; 1.43)	
Current Occupation[b]		0.004†		0.14†
Yes	1.00		1.00	
No	0.80 (0.69; 0.93)		0.89 (0.76; 1.04)	
Literacy[b]		0.001†		<0.001†
Literate	1.00		1.00	
Illiterate	0.64 (0.50; 0.83)		0.62 (0.47; 0.81)	
Living arrangement[b]		0.10†		0.17†
Alone	1.00		1.00	
Accompanied	1.24 (0.96; 1.62)		1.19 (0.93; 1.52)	

PR: Prevalence ratio. 95%CI: 95%confidence interval; *: Adjusted for the same level variables and higher with p-value <0.20. a=1º level; b=2º level. † Wald test for heterogeneity; ‡ Wald test Wald test for linear tendency.

for suitable dietary habits in illiterate elderly, this being 55% less when compared to their peers.

DISCUSSION

The results of this study showed that there were important differences in the prevalence of the consumption of most food groups (except the consumption of eggs, beans or lentils) and adequate dietary habits among the elderly of both cities. The highest prevalence being observed in AC-SC. The regression models identified that lower age (in AC-SC) and better education (in both municipalities) were the potential sociodemographic determinants of dietary habits.

The frequency of consumption of meat, dairy and derivative food groups of fruits and vegetables was higher in the municipality of AC-SC compared with LC-BA. Considering the existing socioeconomic inequality that exists between the northeast and southern regions of Brazil, these differences were expected. The information derived from the Brazilian Consumer Expenditure Survey (Portuguese acronym POF) 2008-2009[3] showed that less than 10% of the Brazilian population reach the recommended consumption levels of fruit and vegetables and also showed that the consumption of these food groups increased proportionally with increasing income.

The consumption of meat is important to maintain muscle mass[14] and also so that iron serum levels are at adequate levels[15]. Lean body mass changes over the years, decreasing considerably in older adults[14] and anemia is also a frequent condition in older people[16]. Low protein intake is associated with the impairment of

Table 5. Crude and adjusted analysis of the association between the adequate dietary habits and socio-demographic variables in older adults from Lafaiete Coutinho (LC-BA).

Variables	Crude analysis		Adjusted analysis*	
	PR (95% IC)	p	PR (95% IC)	p
Sex[a]		0.70†		0.77†
Female	1.00		1.00	
Male	1.09 (0.71; 1.65)		1.07 (0.70; 1.63)	
Age group (years)[a]		0.39‡		0.39‡
60 to 69	1.00		1.00	
70 to 79	0.86 (0.53; 1.41)		0.86 (0.53; 1.41)	
≥80	0.80 (0.47; 1.35)		0.80 (0.47; 1.35)	
Marital Status[b]		0.13†		0.24†
With partner	1.00		1.00	
Without partner	0.71 (0.46; 1.11)		0.77 (0.50; 1.19)	
Current Occupation[b]		0.53†		0.91†
Yes	1.00		1.00	
No	0.82 (0.45; 1.51)		0.99 (0.54; 1.81)	
Literacy[b]		0.001†		0.001†
Literate	1.00		1.00	
Illiterate	0.45 (0.30; 0.68)		0.45 (0.30; 0.68)	
Living arrangement[b]		0.91†		0.55†
Alone	1.00		1.00	
Accompanied	0.97 (0.55; 1.71)		0.82 (0.42; 1.59)	

PR: Prevalence ratio. 95% CI: 95%confidence interval; *: Adjusted for the same level variables and higher with p-value <0.20. a=1º level; b=2º level. † Wald test for heterogeneity; ‡ Wald test Wald test for linear tendency.

lean body mass, muscle function and immune response, as well as increased loss of bone density[14].

Data from the Brazilian Consumer Expenditure Survey showed that the consumption of dairy products such as cheese, increases with increasing age and income. However, calcium, which can be obtained by eating this food group, was one of the micronutrients with the highest percentage of inadequacy in older adults of both sexes[2]. Food consumption in this group should be encouraged, since milk and its derivatives have high quantities of nutrients such as minerals, vitamins and proteins[17].

Regarding the consumption of liquids per day, the results showed higher prevalence in participants from AC-SC. Older adults tend to feel less thirsty due to the reduction in this sensitivity, thus, together with the frequent use of diuretic medications, dehydration becomes more common in this age group[15]. Diets with more than five glasses of fluids have been associated with improvement of cognitive function in older adults[18]. Thus, fluid consumption should also be encouraged.

The comparative analysis between the two locations showed that the prevalence of adequate dietary habits were greater for older adults from the city of AC-SC, regardless of the associated categories, with the exception being those aged 80 years and above, literate and living alone. This reinforces the idea that different socioeconomic, environmental and cultural contexts can have a direct influence on the eating patterns of different populations[1].

In the specific case of this study, results show that demographic factors are key elements in explaining these differences, as is suggested by other research[19,20].

Based on the findings of this study, the inverse relationship of dietary habits with age and education is highlighted as one of the explanations for the lower consumption of adequate food patterns by older adults from LC-BA. As AC-SC has a significantly higher population density of those aged from 60 to 69 years and a larger proportion of literate older adults, determinants of adequate dietary habits weigh more in favor of the municipality of AC-SC than LC-BA.

In LC-BA, the prevalence in the consumption of food groups investigated was lower compared to AC-SC. This difference may be a result of cultural, climatic, economic and social characteristics of each region and the interference of these in the feeding[7]. When analyzing the socioeconomic indicators of the municipalities, important differences are identified. For example, the Human Development Index is 0.882 in AC-SC and 0.607 in LC-BA[21]. In reference to the Gini Coefficient, a measurement of the inequality of income distribution, there is a greater inequality in income distribution in LC-BA (Gini Coefficient, 0.51) when compared to AC-SC (Gini Coefficient, 0.43)[22]. These factors suggest the existence of a relationship between lower adequacy in dietary habits and poorer socioeconomic indicators.

The limitations of the present study should be mentioned. First, the investigation on dietary habits did not cover all food groups, which may have meant some foods that older people regularly consume were missed. There is evidence that inadequate intake (insufficient or excessive) of some foods is associated with risk factors for chronic diseases[4], and the questions do not identify a healthy or unhealthy behaviors. However, the questions (instrument) are validated in various contexts and have been widely used in different regions of the world as part of nutritional screening for older people[23]. Second, some of the respondents received assistance from their companion/caregiver during the interview, which may have lead to the omission of some replies. At last, another possible limitation was the cross-sectional design that does not allow establishing a cause-effect relationship. However, the observed associations are supported by literature[3,7,19,20]. Despite these limitations, this study provided strong points that should also be highlighted. This study is a pioneer in food information comparison for older people from two cities, located in different regions. In addition, the adopted methodological characteristics were similar between the municipalities, as well as the accuracy regarding the collection and quality control of information.

CONCLUSION

In conclusion, despite improvements, socio-demographic inequalities persist in Brazil and these continue to affect dietary habits. Older adults from regions with better socio-demographic indicators are more likely to present a higher prevalence in consumption of the investigated food. However, even with the sociodemographic differences that exist in Brazil, literacy stands out as a potential indicator for appropriate dietary habits in older adults, regardless of the region investigated. We propose further studies should be conducted, with objective evaluating and monitoring the dietary habits of older people living in various Brazilian cities. Through such studies, it is hoped that public policy formulation in the promotion of food-orientated health programs for older adults, can be tailored to meet the specifics of each Brazilian region.

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