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ORIGINAL

Availability of foods according to the degree of processing in families with young elderly and oldest-old (POF 2017-2018)

Disponibilidade de alimentos de acordo com o grau de processamento em famílias com idosos jovens e longevos (POF 2017-2018)

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ABSTRACT

Objective

To compare the availability of healthy and unhealthy foods in families with and without elderly and oldest-old people.

Methods

This is an observational, cross-sectional study with secondary data from the Household Budget Survey, conducted by the Brazilian Institute of Geography and Statistics between 2017 and 2018. Families were characterized based on the oldest member: Control (without elderly and oldest-old) or with elderly and oldest-old. The sociodemographic characteristics of the families and the foods purchased by the families were obtained, according to the Nova classification (*in natura*, processed and ultra-processed foods, in addition to culinary ingredients).

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Results

Families with elderly and oldest-old people had greater availability of fresh foods and fewer ultra-processed foods. In contrast, young families showed greater acquisition of all ultra-processed food items.

Conclusion

The unfavorable nutritional transition process with fewer *in natura* foods seemed to be less evident in families with higher age groups. It is concluded that the presence of the elderly and oldest-old in the family could be related to a better quality of the family diet, with a greater presence of fresh foods and a lower acquisition of ultra-processed foods.

Keywords: Aged, 80 and over. Demography. Elderly nutrition. Nutrition surveys.

RESUMO

Objetivo

Comparar a disponibilidade de alimentos saudáveis e não saudáveis nas famílias com e sem idosos e longevos.

Métodos

É um estudo observacional, transversal com dados secundários da Pesquisa de Orçamento Familiar, realizada pelo Instituto Brasileiro de Geografia e Estatística entre 2017-2018. As famílias foram caracterizadas pelo integrante com maior idade: controle (sem idosos e longevos), com idosos e longevos. Foram obtidas características sociodemográficas das famílias e itens alimentares adquiridos pelas famílias, segundo a classificação Nova (alimentos in natura, processados e ultraprocessados, além de ingredientes culinários).

Resultados

As famílias com idosos e longevos apresentaram maior disponibilidade de alimentos in natura e menor em ultraprocessados. Enquanto que as famílias jovens apresentaram maior aquisição em todos os itens alimentares ultraprocessados.

Conclusão

O processo de transição nutricional desfavorável com menos alimentos in natura pareceu ser menos evidente em famílias com maiores faixas-etárias. Conclui-se que a presença de idosos e longevos na família pode estar relacionada à melhor qualidade alimentar familiar, com maior presença de alimentos in natura e menor aquisição de ultraprocessados.

Palavras-chave: *Idoso de 80 anos ou mais. Demografia. Nutrição do idoso. Inquéritos nutricionais.*

INTRODUCTION

Population aging is an achievement of humanity and a major challenge, making it necessary to adapt public and socioeconomic policies so that they meet the needs of the elderly (60 years and over) and provide a better quality of life, especially the oldest (≥80 years), which is the fastest growing age group in the world [1,2].

Healthy eating is essential at all stages of life, but it has great relevance in aging, as physiological, psychological, and social changes, as well as chronic diseases, the use of medication, difficulties in eating, and changes in mobility exert a major influence on nutritional status [3,4].

Although the dietary pattern of the elderly consists mainly of *in natura* foods such as rice, beans, meat, and milk, it is poor in fruits and vegetables. In addition, ultra-processed foods such as crackers, industrially produced bread, sausage, ham, candies, and sweets, are quite common in their diet [4]. Therefore, assessing the quality of foods is crucial for developing effective nutritional interventions to promote healthy eating [5]. Few studies have demonstrated the difference in eating habits of the elderly and the oldest-old.

The *Instituto Brasileiro de Geografia e Estatística* (IBGE, Brazilian Institute of Geography and Statistics) regularly conducts the *Pesquisa de Orçamento Familiar* (POF, Family Budget Survey), most recently in 2018. POF is a population-based survey that aims to represent the consumption habits, including food

consumption of Brazilian families. The data are publicly available [6]. Through the family composition, potential differences in the eating habits of the elderly and oldest-old can be observed. Therefore, the objective of the present study was to compare the availability of healthy and unhealthy food items in families with and without elderly and oldest-old persons, according to the Nova classification.

METHODS

This is a secondary analysis of a quantitative, descriptive, observational cross-sectional study. Data were extracted from POF microdata conducted by IBGE between 2017-2018.

The target population of this study was families living in the five Brazilian regions. Initially, 57,920 families were found, classified into 3 groups according to the age of the oldest member: Families without elderly and oldest-old individuals (control), families with elderly individuals (60-79 years, elderly), and family with oldest-old individuals. We found 16,095 families with elderly people (28%) and 3,389 families with oldest-old people (6%). A total of 8,536 families who did not buy any food item in the month surveyed were excluded from the sample.

Information from the 2017-2018 POF was obtained directly from the selected households, through interviews with residents over a period of nine consecutive days. The data collection instruments used in the 2017-2018 POF were organized into 7 questionnaires, according to the type of information to be researched. For this research, information from the Questionnaire on the Characteristics of Household and Residents (POF 1) and the monetary and non-monetary acquisition of food and beverages from the Manual on Collective Acquisition (POF 3) were used [7].

Foods were grouped into food groups according to the degree of processing, according to the Nova classification, adopted by the Ministry of Health, which divides foods into the following categories: *in natura* or minimally processed, culinary ingredients, processed foods, and ultra-processed foods [8,9]. According to the NOVA classification, a healthy diet is based on the consumption of *in natura* or minimally processed and culinary ingredients in small quantities used to cook and season *in natura* or minimally processed. In addition, processed foods can also be used in small amounts as part of or as an accompaniment to culinary preparations. On the other hand, ultra-processed foods should be avoided and are considered unhealthy foods for the population [8].

A descriptive analysis of the distribution of sociodemographic characteristics (predominant race in the family, type of household, family regions) and food groups (Table 1) was performed among the research groups and tested by the chi-square. The frequency of family arrangements among the family groups of elderly and oldest-old people was analyzed. means and standard deviations of total family and per capita income, schooling, family age, and percentage of women and men in families were calculated for each group and tested by Analysis of Variance (ANOVA). Significance levels of less than 5% ($p<0.05$) were considered significant. The analyzes will be performed by Epi Info (version 7.2.3.1).

Data do not include participant identification of. In accordance with article 1 of Resolution nº 510/16, research that uses information in the public domain will not be registered or evaluated by the CEP/CONEP system [10].

RESULTS

A total of 49,384 families were evaluated, of which 32,678 (66%) had no elderly or oldest-old people in the family (control), 13,805 had at least one elderly person (28%), and 2,901 had at least one oldest-old person (5.9%).

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The sociodemographic characteristics of the sample are shown in Table 1, where all the demographic variables evaluated showed a statistically significant difference or association ($p<0.05$). Families were predominantly female, with a gradual increase in the proportion in the study groups. The control group had a higher average number of years of schooling and also had a higher number of residents in the family. The average total income gradually increased between groups, being higher in the oldest-old group, while the average *per capita* income was higher in families with elderly people. The greater predominance of color/ethnicity in the families was brown, but white was predominant in the elderly group and even more so in the oldest-old individuals. Most of the sample lived in urban households, being more frequent among the oldest-old group. Among the minority who lived in rural households, the proportion was higher in the elderly group. Most of the families surveyed were from the Southeast, Northeast, and North regions, most of those with elderly people were from the Northeast and among the oldest-old, most were from the Southeast.

Table 1 – Sociodemographic characterization. Brazil, 2017-2018.

Variables	Control	Elderly	Oldest-old	Total	*p*
	M±SD	M±SD	M±SD	M±SD	
Age	30.7±11.1	53.6±13.8	65.8±16.1	50.0±13.7	<0.001
Women	50.2±24.5	53.3±27.3	58.5±28.0	54.0±26.6	<0.001
Men	49.8±24.5	46.7±27.3	41.5±28.0	46.0±26.6	<0.001
Schooling years	9.7±3.8	7.2±4.4	5.9±4.1	7.6±4.1	<0.001
Residents	3.28±1.5	2.81±1.6	2.91±1.7	2.76±1.6	<0.001
Total income R$	4.582.3±7.766.1	5.159.8±9.359.9	5.300.5±5.881.9	5.014.2±7.669.3	<0.001
Per capita income R$	1.679.9±3.166.5	2.234.0±5.061.9	2.181.7±2.964.9	2.031.9±3.731.1	<0.001
Color/ethnicity predominance	n (%)	n (%)	n (%)	n (%)	
Yellow	90 (0.28)	53 (0.38)	13 (0.45)	156 (0.32)	
White	13994 (42.82)	6587 (47.71)	1476 (50.88)	22057 (44.66)	
Indigenous	92 (0.28)	33 (0.24)	7 (0.24)	132 (0.27)	
Multiethnic	26 (0.08)	13 (0.09)	2 (0.07)	41 (0.08)	<0.001
Brown	16265 (49.77)	6133 (44.43)	1204 (41.50)	23602 (47.79)	
Black	2173 (6.65)	961 (6.96)	195 (6.72)	3329 (6.74)	
No declaration	38 (0.12)	25 (0.18)	4 (0.14)	67 (0.14)	
Household type	n (%)	n (%)	n (%)	n (%)	
Rural	7170 (21.94)	3171 (22.97)	606 (20.89)	10947 (22.17)	0.012
Urban	25508 (78.06)	10634 (77.03)	2295 (79.11))	38437 (77.83)	
Geographic regions of Brazil	n (%)	n (%)	n (%)	n (%)	
Southeast	11411 (65.46)	4857 (27.86)	1163 (6.67)	17431 (35.30)	
Northeast	7575 (63.02)	3656 (30.42)	789 (6.56)	12020 (24.34)	
North	5173 (73.22)	1606 (22.73)	286 (4.05)	7065 (14.31)	<0.001
South	4514 (63.96)	2127 (30.14)	416 (5.89)	7057 (14.29)	
Midwest	4005 (68.92)	1559 (26.83)	247 (4.25)	5811 (11.77)	
Total	32678 (66.17)	13805 (27.95)	2901 (5.87)	49384 (100)	

Note: M: Mean; SD: Standard Deviation.

Table 2 shows the distribution of the frequency of acquisition of food groups among the groups. The *in natura* foods for which there was a significant relationship between the groups were vegetables, unsweetened beverages, legumes, oilseeds, and seeds, which were more frequent in the elderly group. While fruits, milk, and dairy products were more common in the oldest-old group. The culinary ingredients or which there was a significant association between the groups were the acquisition of sugar (more in the

elderly) and other ingredients (more in the oldest-old). For processed foods, there was a significant association with purchasing canned and processed foods (less often in the oldest-old group), processed meat and fish (less acquired in the elderly group), and sweets made from fruit (more often purchased in the oldest-old group). All ultra-processed foods showed a statistically significant relationship with the groups. The oldest-old group was the least likely to purchase ultra-processed food items: soft drinks, sausages, sweets, margarine and other fats, spices, pasta and instant noodles, and alcoholic beverages. The elderly group was less likely to purchase bakery items, ultra-processed dairy products, and ready-made products and mixes.

Table 2 – Distribution of the frequency of acquisition of food groups. Brazil, 2017-2018.

Variables	Control	Elderly	Oldest-old	Total	*p*
	n (%)	n (%)	n (%)	n (%)	
In natura food					
Meat and eggs	21872 (66.93)	9276 (67.19)	1964 (67.70)	33112 (67.05)	0.641
Vegetables	16196 (49.56)	7495 (54.29)	1573 (54.22)	25264 (51.16)	<0.001
Cereals, pasta and flour	14884 (45.55)	6363 (46.09)	1303 (44.92)	22550 (45.66)	0.396
Milk and dairy	14655 (44.85)	6014 (43.56)	1356 (46.74)	22025 (44.60)	0.002
Fruit	13446 (41.15)	6471 (46.87)	1457 (50.22)	21374 (43.28)	<0.001
Unsweetened beverages,	11247 (34.42)	5027 (36.41)	1049 (36.16)	17323 (35.08)	<0.001
legume, oilseeds and seeds	7571 (23.17)	3355 (24.30)	678 (23.37)	11604 (23.50)	0.031
Culinary ingredients					
Sugar	7903 (24.18)	3493 (25.30)	730 (25.16)	12126 (24.55)	0.028
Oils and fat	7929 (24.26)	3375 (24.45)	682 (23.51)	11986 (24.27)	0.562
Salt	2939 (8.99)	1305 (9.45)	281 (9.69)	4525 (9.16)	0.176
Other ingredients	2766 (8.46)	1290 (9.34)	293 (10.10)	4349 (8.81)	<0.001
Processed food					
Bread and processed cereals	19893 (60.88)	8379 (60.70)	1802 (62.12)	30074 (60.90)	0.358
Cheese	6257 (19.15)	2634 (19.08)	569 (19.61)	9460 (19.16)	0.800
Canned and processed foods	4624 (14.15)	1707 (12.37)	339 (11.69)	6670 (13.51)	<0.001
Processed meat and fish	3362 (10.29)	1261 (9.13)	275 (9.48)	4898 (9.92)	0.001
Sweets made from fruit	1019 (3.12)	517 (3.75)	129 (4.45)	1665 (3.37)	<0.001
Ultra-processed food					
Bakery items	15785 (48.30)	6090 (44.11)	1386 (47.78)	23261 (47.10)	<0.001
Non-alcoholic beverages	11713 (35.84)	3962 (28.70)	784 (27.03)	16459 (33.33)	<0.001
Sausages	9769 (29.89)	3326 (24.09)	636 (21.92)	13731 (27.80)	<0.001
Sweets	6785 (20.76)	2365 (17.13)	492 (16.96)	9642 (19.52)	<0.001
Ultra-processed dairy	4813 (14.73)	1800 (13.04)	387 (13.34)	7000 (14.17)	<0.001
Margarine and other fats	4741 (14.51)	1851 (13.41)	379 (13.06)	6971 (14.12)	0.002
Spices	4244 (12.99)	1557 (11.28)	318 (10.96)	6119 (12.39)	<0.001
Ready-made products and mixtures	4174 (12.77)	1419 (10.28)	323 (11.13)	5916 (11.98)	<0.001
Instant noodles and pasta	3538 (10.83)	1236 (8.95)	230 (7.93)	5004 (10.13)	<0.001
Alcoholic beverages	3058 (9.36)	1118 (8.10)	171 (5.89)	4347 (8.80)	<0.001
Total	32678 (66.17)	13805 (27.95)	2901 (5.87)	49384 (100.00)	

DISCUSSION

In our study, among the *in natura* foods, families with an oldest-old individual were the ones who bought the most meat, fruit, milk, and dairy products. Families with an elderly people bought more vegetables, cereals, pasta and flour, unsweetened beverages, legumes, oilseeds and seeds. In addition, the

control group was the one that purchased less fresh food. In terms of culinary ingredients, sugar, oils and fats were purchased more by families with elderly people. Salt and other ingredients, on the other hand, were bought more by families with oldest-old people. This work is the first to make such a comparison, and there is no similar report in the literature.

Families without the elderly had lower fresh food consumption and dietary variability in our study. Silva and Claro [11], comparing consumption between 2008 and 2016, found that individuals aged 18-24 years consumed fewer healthy foods and that, in contrast, individuals aged 55 years or older began to eat more healthy foods. Canella *et al.* [12] also found a direct positive relationship between age and consumption of vegetables and an inverse relationship with consumption of ultra-processed foods. These studies, together with our findings, demonstrate a greater concern for healthy eating as people age. Older individuals tend to consume more fruits and vegetables and fewer ultra-processed foods [12]. Kovalskys *et al.* [13] observed that in almost all Latin American countries surveyed, the elderly was the layer of the population that most frequently consumed fruits and vegetables. This corroborates with our findings that families with higher age groups tend to have a diet richer in *in natura* foods, as recommended in the Food Guide, which aims to effectively improve food quality [8]. This demonstrates that the presence of elderly people in the family leads to a higher proportion of healthier foods in the family.

Reviewing the literature, we found that the dietary behavior of the Brazilian population has changed in recent decades. The consumption of *in natura* foods and culinary ingredients is decreasing and being replaced by the consumption of ultra-processed food products [14,15]. It is already known that ultra-processed foods have an imbalanced nutrient composition and are rich in calories, fats, sugars, sodium, and chemical additives. Moreover, they are closely related to non-communicable chronic diseases and should be avoided [8]. The analysis performed in the present study shows that this unfavorable process may be less pronounced in families with elderly and oldest-old people.

In addition, it may indicate that families with elderly and oldest-old people tend to cook more, which may be related to the cultural habit of the older ones to cook more than the younger ones and also not to have the habit of eating ultra-processed foods, since the expressive growth of these foods began in the 1980s [12]. The Food Guide itself states that less cooking and less passing of culinary skills between generations favors the consumption of ultra-processed foods [8]. In this way, the act of cooking is beneficial because it increases the chances of eating more fresh foods and having a healthier family diet with more homemade culinary preparations and fewer ultra-processed foods.

Investigating the relationship between the consumption of ultra-processed foods and unfavorable outcomes is of particular interest in countries in nutritional transition, such as Brazil. Therefore, methods for tracking consumption of these foods are needed, and household budget surveys represent a feasible way to collect these data at the national and global levels. Unlike data on individual food intake, which are scarce, imprecise, and rarely nationally representative in low-income countries, household budget surveys are widely available and conducted periodically to monitor the cost of living at the national level in a large number of countries; these data can be used to track changes in food consumption patterns. However, there are several limitations that narrow its usefulness for assessing food consumption, as household surveys do not provide information on the food consumed by family members and how its distribution within the family group occurs. Another limitation is that food purchasing surveys do not take into account cooking waste, spoilage, leftovers, or meals that are not consumed at home [16].

CONCLUSION

With this study, it was possible to compare the availability of healthy and unhealthy foods, according to the Nova classification, in families with and without elderly and oldest-old people. In families with elderly and oldest-old people, more healthy foods (*in natura*) and less unhealthy foods (ultra-processed) were available. Families with the elderly and oldest-old people were the ones who purchased the healthiest food items, *in natura* foods such as vegetables, fruits, milk, and dairy products, meat and eggs, cereals, pasta and flour, unsweetened beverages, legumes, oilseeds, and seeds. In addition, there is a greater presence in the purchase of culinary ingredients, which indicates that families with elderly and oldest-old people tend to cook more.

In young families without the presence of elderly and oldest-old people, the acquisition of healthy foods was the least predominant and the acquisition of ultra-processed foods prevailed when compared to families of higher age groups. It is known that the proportion of ultra-processed foods in the diet determines the nutritional quality of the food. Despite the unfavorable nutritional transition with the greater presence of ultra-processed foods and the reduction in the acquisition of traditional foods in Brazilian families, this process seemed to be less evident in families with higher age groups, since the presence of elderly and oldest-old people in the family led to a greater presence of healthier foods in the families and the preparation of their food. Since more culinary ingredients were also acquired in these families, we believe that it was beneficial for these families to maintain the habit of using these ingredients to cook *in natura* foods and make more homemade culinary preparations and acquire less ultra-processed foods.

With this study, it was also possible to observe the great relevance of researching food availability regarding the level of food processing in families with the elderly and oldest-old people, since it is possible to monitor the eating habits of large populations using data from family budget surveys and to observe the nutritional quality of these populations. However, further studies are still needed to deepen the relationship between sociodemographic characteristics and the acquisition of healthy and unhealthy foods in the older population. This is even more important due to the scarcity of studies that seek to characterize the quality of the diet of the elderly and oldest-old using national data, such as the POF. Therefore, the present work can serve as a basis for a comparative analysis of eating habits in different countries, regardless of their eating habits.

CONTRIBUTORS

LR CAMARGO contributed to the conception and design, analysis and interpretation of data, review, and approval of the final version of the article. AJG BÓS also contributed to the conception and design, analysis and interpretation of data, review, and approval of the final version of the article.

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