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Artículo Original

Food insecurity and malnutrition in older adults from the Family Health Strategy in the Northeast of Brazil

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Abstract: Food insecurity and malnutrition in older adults from the Family Health Strategy in the Northeast of Brazil. Introduction: Food insecurity (FI) is a state characterized by instability and irregularity of access to food. This condition has negative impacts on dietary intake, affecting nutritional status and health condition. **Objective:** To evaluate the association between malnutrition and FI among community-dwelling older adults attended to under the Family Health Strategy (FHS). **Materials and methods:** This is a cross-sectional study conducted using community-dwelling older adults attended to under the FHS in the municipality of Barreiras, in Bahia, Brazil. Between 2017 e 2018, we collected demographic, social, economic, health condition, lifestyle, anthropometric, and food consumption data. We evaluated nutritional status using the Mini Nutritional Assessment (MNA) and we assessed FI with the Brazilian Food Insecurity Scale (EBIA). Besides the chi-squared test, we carried out a binary logistic regression to verify the association between malnutrition and FI, adjusted for possible confounding factors. The significance level was p<0.05. **Results:** We evaluated 307 older adults with a mean age of 70.4 (±7.5 years). The prevalence of malnutrition/risk of malnutrition was 35.2% and that of FI was 63.5%. Households with older adults in moderate/severe FI presented almost three times more chance (OR 2.97; CI95% 1.37-6.44) of having malnutrition compared with those in food security. **Conclusions:** The study indicates that there is an association between household FI and malnutrition/risk of malnutrition among older adults from the FHS, especially among those in severe FI. This result attributes to FI the status of determinant of malnutrition in older adults within the context investigated. **Arch Latinoam Nutr 2022; 72(4): 273-282.**

Keywords: older adults, food insecurity, nutritional status, malnutrition, family health.

Resumen: Inseguridad alimentaria y desnutrición en adultos mayores de la Estrategia Salud de la Familia del nordeste brasileño. Introducción: La inseguridad alimentaria (IA) es un estado caracterizado por la inestabilidad e irregularidad en el acceso a los alimentos. Esta condición tiene impactos negativos en la ingesta de alimentos, afectando el estado nutricional y la condición de salud. **Objetivo:** Evaluar la asociación entre desnutrición e IA en adultos mayores comunitarios atendidos en la Estrategia Salud de la Familia (ESF). **Materiales y métodos:** Estudio transversal realizado con ancianos de comunidad atendidos en la ESF del municipio Barreiras, Bahía, Brasil. Entre 2017 y 2018, se recolectaron datos demográficos, sociales, económicos, condición de salud, estilo de vida, antropométricos y de consumo de alimentos. El estado nutricional se evaluó por la Mini Evaluación Nutricional (MEN) y la IA con la Escala Brasilera de Inseguridad Alimentaria (EBIA). Además de la prueba de chi-cuadrado, se realizó una regresión logística binaria para verificar la asociación entre desnutrición e IA, ajustada para posibles factores de confusión. El nivel de significancia fue p<0,05. **Resultados:** Fueron evaluados 307 ancianos, con una edad media de 70,4 (±7,5 años). La prevalencia de desnutrición/riesgo de desnutrición fue de 35,2% y la de IA de 63,5%. Los hogares con adultos mayores en IA moderada/grave presentaron casi tres veces más chance (OR 2,97; IC95% 1,37-6,44) de tener desnutrición en comparación con aquellos en Seguridad Alimentaria y Nutricional. **Conclusiones:** El estudio apunta que existe asociación entre la IA domiciliaria y desnutrición/riesgo de desnutrición entre los ancianos de la ESF, especialmente entre aquellos con IA severa. Este resultado atribuye a la IA un estatus de determinante de la desnutrición en ancianos en el contexto investigado. **Arch Latinoam Nutr 2022; 72(4): 273-282.**

Palabras clave: anciano, inseguridad alimentaria, estado nutricional, desnutrición, salud de la familia.

Introduction

An adequate nutritional status (NS) is fundamental in the aging process, helping to maintain good health and reducing the risk of morbidities (1,2). The elderly population, however, is exposed to alterations in NS, such as obesity, sarcopenia,

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malnutrition, and cachexia (3,4). Among these, malnutrition is still considered a public health problem, related with the appearance of health issues, chronic and degenerative diseases, and increased mortality (5). One of the aspects related with malnutrition in older adults is food insecurity (FI), a condition that limits and conditions food consumption, compromising the NS of these individuals (6,7).

With the aging process, the body undergoes physiopathological alterations that can contribute to a reduction in dietary intake, as well as unintentional weight change (4,5). Among the determinants of malnutrition in older adults, we can mention alterations of the digestive system, reduced sensorial function, the use of multiple medications, loneliness, depression, consumptive diseases, and functional and cognitive decline, which compromise the older adult's capacity to acquire, prepare, and consume foods (5,8). Besides these aspects, FI, which is characterized by physical and economic difficulties in accessing foods, can represent another important predictor of malnutrition, especially by producing alterations in food consumption among older adults exposed to this condition (6,9).

Dietary strategies created by older adults in FI include reducing the quantity of foods consumed, as well as decreasing diet quality, causing a reduction in the general quantity of macro and micronutrients ingested (7,10). Consequently, these individuals can become more exposed to malnutrition, nutritional deficiencies, and a more compromised general state of health (11–13).

The Family Health Strategy (FHS) is a non-material technological innovation in health, derived from a more comprehensive conception of the health-disease process, ensuring a powerful and effective approach to organizing Primary Health Care (PHC) in Brazil, with a very important impact on the health of the Brazilian population (14,15). Despite community-dwelling older adults cared for through the FHS having a certain degree of social protection through access to periodic medical consultations, diagnostic testing, free medications, and the possibility of referrals for specialist treatments, these people generally present a lower socioeconomic level and a higher degree of vulnerability, thus being more exposed (to the factors related) to malnutrition and FI (16-20).

Given the scarcity of studies on this topic (7), the increase in FI, and the permanence of malnutrition as a serious nutritional disorder among older adults, it is important to understand the relationship between these conditions, especially when there is evidence that FI and its different forms (mild, moderate, and severe) influence the appearance of malnutrition. Thus, the aim of this study was to evaluate the association between malnutrition and FI among community-dwelling older adults attended to under the FHS.

Materials and methods

Study type, participants, and sampling procedure

This is a cross-sectional and quantitative study conducted using older adults living in private households, linked to a parent project entitled "Health assessment of older adults in the municipality of Barreiras (BA)." The city of Barreiras is located in the west of Bahia, in the Northeast region of Brazil, and has an estimated population of 158 thousand inhabitants (21). It is notable for its agricultural sector and has a high human development index (HDI) (0.721). However, in 2021, 7% of the population were living in poverty and 19% in extreme poverty (<US$1.90 per capita/day), revealing the contradictions and social inequalities of Brazil (22).

The target population of this study was formed of community-dwelling older adults (≥60 years old) attended to under the FHS, a PHC program of the Unified Health System (SUS). In 2018, the coverage of the FHS in Barreiras was 52.5%, resulting in a public of 4828 older adults registered at Family Health Units (FHUs). The sample calculation of the parent project, which featured multiple objectives and outcomes, considered a general prevalence of 50%, a 5% error, and a 95% confidence level, leading to a total sample of 356 participants.

Considering that the original sample was not estimated to investigate the object adopted in this study, we chose to calculate the power of the study a posteriori, using the OpenEpi software (OpenEpi,

Atlanta, Georgia). The sample of older adults enabled us to identify an odds ratio (OR) of 2.8, considering a 98% test power, 5% significance level, 44% prevalence in those exposed, and 20% prevalence in the non-exposed.

The sample selection took place in two stages. First, we carried out stratified random sampling with proportional allocation, where we ran a calculation considering the 23 territories covered by the FHS teams to determine the quantity of older adults in each stratum, in order to guarantee the representativeness of the sample. Subsequently, based on the proportional quantitative calculation and the nominal list of older adults in the teams, we carried out simple random sampling to choose the older adults in each team.

Inclusion and exclusion criteria

We included in the study older adults aged 60 or older, of both sexes, who were urban dwellers and registered at the FHUs. We excluded older adults who were institutionalized, hospitalized, suffering from some health condition that prevented them from traveling to the data collection site, or who had some cognitive impairment indicated by the FHS team of health professionals that prevented them from answering the survey questionnaire.

Data collection

The older adults chosen for the study received an invitation at their homes, delivered by the Community Health Agents (CHAs) linked to each FHS team. In the invitations there was information about the research, date, time, conditions for attending the FHUs, and the location chosen for the data collection. If the selected participant refused to take part, the researchers chose to invite the next older adult on the list of those registered with the respective FHS team. If the older adult was not at home when the CHA visited, this health professional returned later to try to contact them. In both cases – refusal and absence – only one replacement attempt was made. If unsuccessful, we considered this as a loss of participant at the time of the data collection.

The data collection was carried out by a trained and standardized multi-professional team, formed of researchers and graduate students from the health area, between February of 2017 and August of 2018. Specific scales were applied to investigate the main variables of interest (FI and malnutrition), as well as a structured questionnaire with questions elaborated by the researchers, which was used to collect the other information: demographic, social, lifestyle, health condition, anthropometric, and food consumption.

Outcome: malnutrition/risk of malnutrition

We evaluated malnutrition/risk of malnutrition using the Mini Nutritional Assessment (MNA) (23–25). This instrument was translated, adapted, and validated for the Brazilian population and can be used in older adults in various settings (community, hospital, and institutional) (26). The MNA enables a multidimensional analysis of the older adult, based on a global assessment (life conditions, use of pharmaceuticals, mobility, and mental disorders), dietary aspects, anthropometric indicators, self-perceptions about health, and NS (23–25). The tool has high sensitivity and specificity in identifying nutritional outcomes, as well as a good correlation with the body mass index (BMI). After the application of the 18 questions of the MNA, a score is generated that enables the older adult's NS to be classified into one of three categories: malnutrition (<17 points), risk of malnutrition (≥17 to ≤23.5 points), or normal NS (≥24 points) (25,27).

Exposure variable: food insecurity

We assessed FI using the Brazilian Food Insecurity Scale (EBIA), a tool that has been widely used since it was translated, adapted, and validated for application in Brazil (28,29). The EBIA is a psychometric scale that analyzes the family/household perception and experience regarding FI and hunger, pondering the difficulties in accessing foods (30). The scale is formed of 14 dichotomous questions for households with the presence of someone under 18 years old and eight questions in the absence of children and adolescents in the household. For each question, a positive answer (yes) corresponds to one point; and each negative answer (no) is given zero points (31). After applying the EBIA, and considering the presence or absence of individuals under 18, the households with older adults are classified into four groups:

food security (FS) (0 points), mild FI (1-3 points without someone <18 years old; 1-5 points with someone <18 years old), moderate FI (4-5 points without someone <18 years old; 6-9 points with someone <18 years old), and severe FI (6-8 points without someone <18 years old; 10-14 points with someone <18 years old) (30).

Covariables

- Demographic and social: age (60 to 69 years old, 70 to 70 years old, or 80 or older), sex (male or female), schooling (<4 years or ≥4 years of study), marital status (with a partner or without a partner), one-person household (yes or no), and presence of a minor in the household (yes or no).
- Lifestyle and health condition: alcohol consumption (yes or no), smoking (yes or no), presence of a morbidity (yes or no), and quantity of medications used (<3 or ≥3 medications). In addition, we assessed the presence of depressive symptoms (no <6 points or yes ≥6 points), using the Geriatric Depression Scale (GDS), which was translated and adapted for older Brazilian adults (32).
- Anthropometric: adductor pollicis muscle thickness (APMT) considered the following parameters: men, normal >9.5mm, moderate and severe depletion ≤9.5mm; women, normal >8mm, moderate and severe depletion ≤8mm (33). This measure was calculated using a Sanny clinical adipometer (Sanny, São Bernardo do Campo, São Paulo, Brazil), model Ad1009, graded in millimeters. Hand grip strength (HGS) (with low strength: women, <16kg, men, <30kg; without low strength: women, ≥16kg, men, ≥30kg) (34) was measured following the technique proposed by Fess (35). The equipment used to calculate HGS was the Saehan® hydraulic hand dynamometer (Saehan Corporation, 973, Yangdeok-Dong, Masan 630-728, Korea), model SH5001, with two kilograms-strength precision.
- Dietary consumption: number of meals (<3 or ≥3 meals); daily consumption of meat (yes or no); daily consumption of milk and derivatives (yes or no); daily consumption of fruit/vegetables (yes or no); and weekly consumption of legumes/eggs (yes or no). For the dietary consumption assessment we used the dietary questions present in the MNA (25).

Statistical analysis

To characterize the sample, we calculated the absolute and relative frequencies of the categorical variables. We also conducted a bivariate analysis that included the chi-squared test, considering the associations between NS (categorized as normal and malnutrition/risk), FI situation (grouped into FS and FI), and the covariables.

In addition, we ran a binary logistic regression, with hierarchized modeling, to calculate the crude and adjusted odds ratios (ORs) and their respective 95% confidence intervals (CI95%). At this point in the analysis, FI was presented in three categories: 1) FS, 2) mild FI, and 3) moderate/severe FI. The inclusion of the independent variables in the models considered those with $p<0.20$ in the bivariate analysis, assuming malnutrition as an output. Model I included only FI; II added the demographic and social variables; III included lifestyle and health conditions; and model IV (the final one) inserted the anthropometric and food consumption variables. We made an adjustment for sex and age and for all the analyses we used $\alpha = 0.05$ to determine the statistical significance. We used the Statistical Package for the Social Sciences (SPSS, Chicago, IL, USA), version 20.0, in the analyses.

Ethical aspects

The study participants were informed about the objectives and procedures of the research they formed part of. The adhesion of the older adults was voluntary and dependent on their signature or fingerprint on the Free and Informed Consent Form (FICF). In addition, the study was approved by the Research Ethics Committee of the São Francisco Faculty of Barreiras (FASB), under case n. 1,447,361/2016.

Results

In this study, we evaluated 307 older adults (13.7% losses), 60.6% of whom were female, with a mean age of 70.4 (±7.5 years). The prevalence of malnutrition/risk of malnutrition was 35.2% (3.3% malnutrition and

31.9% risk of malnutrition) and that of FI was 63.5% in the households with older adults (38.4% mild FI and 25.1% moderate/severe FI) (Table 1).

Other characteristics of the sample show that 55.0% of the older adults were aged between 60 and 69 and 72.6% had fewer than four years of study. A small portion of the older adults lived alone (16.3%), smoked (11.1%), or consumed some type of alcoholic drink (14.3%). The presence

Table 1: General characteristics of the study population. (n=307)

Variables/categories	N	%	Variables/categories	N	%
Nutritional Status			Morbidity		
Normal	199	64.8	No	88	28.7
Malnutrition and risk	108	35.2	Yes	219	71.3
Food insecurity			Quantity of medications		
Food security	112	36.5	< 3	156	50.8
Mild FI	118	38.4	≥ 3	151	49.2
Moderate and severe FI	77	25.1	Depressive symptoms		
Age (years)			No	223	72.6
60 to 69	169	55.0	Yes	84	27.4
70 to 79	99	32.2	HGS		
80 or older	39	12.7	Without low strength	202	65.8
Sex			With low strength	105	34.2
Male	121	39.4	APMT		
Female	186	60.6	Normal	241	78.5
Schooling			Moderate/severe depletion	66	21.5
≥ 4 years of study	84	27.4	Number of meals (daily)		
<4 years of study	223	72.6	≥ 3 meals	264	86.0
Marital status			< 3 meals	43	14.0
With a partner	161	52.4	Meat (daily)		
Without a partner	146	47.6	Yes	260	84.7
One-person household			No	47	15.3
No	257	83.7	Milk (daily)		
Yes	50	16.3	Yes	161	52.4
Minor			No	146	47.6
No	223	72.6	Fruit/vegetables (daily)		
Yes	84	27.4	Yes	169	55.0
Alcohol consumption			No	138	45.0
No	263	85.7	Legumes/eggs (weekly)		
Yes	44	14.3	Yes	279	90.9
Smoking			No	28	9.1
No	273	88.9			
Yes	34	11.1			

HGS: Hand grip strength; APMT: adductor pollicis muscle thickness; FI: food insecurity

of at least one morbidity was found in 71.3% of the older adults and 27.4% of the population studied presented depressive symptoms. The results for the anthropometric variables indicated 21.5% moderate/severe muscle depletion (APMT) and 34.2% low strength (HGS). Regarding food consumption, most of the older adults (86.0%) had three or more meals a day and frequently consumed meat (84.7%) and legumes/eggs (90.9%). However, an important portion did not frequently consume fruit/vegetables (45.0%) or milk/derivatives (47.6%) (Table 1).

In the bivariate analysis of the association between NS and the other variables of the study, we observed an association between malnutrition/risk of malnutrition and FI, sex, one-person households, depressive symptoms, number of meals, as well as the dietary consumption variables meat, fruit/vegetables, and legumes/eggs (Table 2).

Table 3 presents the results of the binary logistic regression, considering the association between malnutrition/risk of malnutrition and FI, adjusted by the other variables present in the hierarchized model. Model I only considered the association with FI. The demographic and social variables were inserted into model II: sex, age, marital status, and one-person household. In model III we added the lifestyle (alcohol consumption and smoking) and health condition (morbidities, medication, and depressive symptoms) variables. In the final model (model IV), after adjusting other variables, we inserted the anthropometric (APMT) and dietary consumption (number of meals, meat, fruit/vegetables, and legumes/eggs) variables. There was a statistically significant association between malnutrition and FI from model I up to the final model, with mild FI presenting an OR of 2.35 (CI95% 1.19-4.62) and moderate and severe FI presenting an OR of 2.97 (CI95% 1.37-6.44). The final model fit was observed through the value obtained in the Hosmer Lemeshow test (p = 0.601).

Table 2: Characterization of the sample according to nutritional status (normal and malnutrition/risk of malnutrition). (n=307)

Variables/categories	Normal		Malnutrition and risk		*p*-value
	N	%	N	%	
Food Insecurity					
Food security	90	80.4	22	19.6	
Mild FI	72	61.0	46	39.0	0.000*
Moderate and severe FI	37	48.1	40	51.9	
Age (years)					
60 to 69	115	68.0	54	32.0	0.422
Sex					
Female	110	59.1	76	40.9	0.010*
Schooling					
<4 years of study	142	63.7	81	36.3	0.494
Marital status					
Without a partner	87	59.6	59	40.4	0.068
One-person household					
Yes	39	78.0	11	22.0	0.033*
Minor					
Yes	52	61.9	32	38.1	0.511
Alcohol consumption					
Yes	33	75.0	11	25.0	0.127
Smoking					
Yes	18	52.9	16	47.1	0.124
Morbidity					
Yes	148	67.6	71	32.4	0.110
Quantity of medications					
≥ 3	91	60.3	60	39.7	0.100
Depressive symptoms					
Yes	40	47.6	44	52.4	0.000*
HGS					
With low strength	63	60.0	42	40.0	0.202
APMT					
Moderate/severe depletion	38	57.6	28	42.4	0.164
Number of meals (daily)					
< 3 meals	19	44.2	24	55.8	0.002*
Meat (daily)					
No	21	44.7	26	55.3	0.002*
Milk (daily)					
No	92	63.0	54	37.0	0.528
Fruit/vegetables (daily)					
No	79	57.2	59	42.8	0.012*
Legumes/eggs (weekly)					
No	12	42.9	16	57.1	0.011*

* Significance level (p<0.05); Pearson's chi-square test.
HGS: Hand grip strength; APMT: adductor pollicis muscle thickness; FI: food insecurity.

Table 3: Logistic regression between malnutrition/risk of malnutrition, food insecurity, and associated factors. (n=307)

Variables/categories	Model I OR (CI 95%)	Model II OR (CI 95%)	Model III OR (CI 95%)	Model IV OR (CI 95%)
Food Insecurity				
Mild FI	2.61 (1.44-4.73)*	2.71 (1.44-5.10)*	2.45 (1.27-4.71)*	2.35 (1.19-4.62)*
Moderate and severe FI	4.42 (2.31-8.43)*	4.60 (2.29-9.25)*	3.86 (1.86-8.00)*	2.97 (1.37-6.44)*
Sex				
Female		1.60 (0.90-2.83)	1.45 (0.80-2.63)	1.57 (0.85-2.92)
Age (years)				
80 or over		2.18 (0.95-5.02)	1.88 (0.80-4.40)	1.88 (0.78-4.55)
Marital status				
Without a partner		1.45 (0.80-2.63)	1.23 (0.66-2.28)	1.09 (0.57-2.06)
One-person household				
Yes		2.90 (1.26-6.67)*	2.63 (1.13-6.15)*	3.27 (1.32-8.10)*
Alcohol consumption				
Yes			0.63 (0.28-1.42)	0.57 (0.24-1.34)
Smoking				
Yes			1.92 (0.84-4.40)	1.96 (0.83-4.63)
Morbidities				
Yes			0.69 (0.39-1.23)	0.75 (0.41-1.34)
Medications				
≥ 3 medications			1.56 (0.91-2.66)	1.63 (0.94-2.85)
Depressive symptoms				
Yes			1.66 (0.93-2.96)	1.61 (0.89-2.93)
APMT				
Moderate/severe depletion				1.28 (0.67-2.43)
Number of meals				
< 3 meals				1.93 (0.90-4.16)
Meat (daily)				
No				2.07 (0.98-4.37)
Fruit/vegetables (daily)				
No				1.22 (0.68-2.17)
Legumes/eggs (weekly)				
No				2.41 (0.93-6.24)

Significance level (p<0.05); binomial logistic regression.
APMT: adductor pollicis muscle thickness; OR: odds ratio; IC: 95% Confidence Interval.

Discussion

It was possible to observe that malnutrition/risk of malnutrition is associated with FI in households of older adults registered with the FHS in a municipality of the Northeast region of Brazil. The situation of moderate/severe FI stands out, which, after adjustments, increased

the chance of the older adults developing malnutrition/risk of malnutrition by 2.97 times, compared with those households living in FS conditions. These results include FI, with all of its conceptual complexity, among the factors that determine malnutrition in community-dwelling older adults. We also identified high prevalences of malnutrition/risk of malnutrition and of FI. In addition, we observed other factors associated with the study outcome that explain the multi-causal determination of malnutrition: being a woman, living alone, presenting depressive symptoms, having fewer than three meals a day, and not frequently consuming meat, fruit/vegetables, or legumes/eggs.

A systematic review carried out by Pereira *et al*. (7) regarding FI and NS identified that FI is related with malnutrition/risk of malnutrition, especially severe FI. In more severe FI situations, even with the creation of strategies for them to access foods, older adults present a reduction in the quantity and quality of foods consumed, and a consequent deterioration in NS, with unintentional weight loss (7,10).

Studies conducted in other countries have also found similar results. Research conducted in Greece with community-dwelling older adults who attended recreation centers found that FI increased the chance of the participants presenting the risk of malnutrition by 2.63 times (9). In Portugal, community-dwelling older adults in a FI situation presented 72% more chance of developing malnutrition (36). In another study conducted using older Turkish adults on a low income, the presence of FI significantly increased the risk of malnutrition (6).

High prevalences of malnutrition and FI have been found in other studies of community-dwelling older adults. In Brazil, research that used the MNA on older adults cared for by the FHS indicated that malnutrition/risk of malnutrition varied from 24.1% to 46.5% (37,38). A systematic review with a meta-analysis that evaluated 58 studies of community-dwelling older adults indicated a 26.5% (CI95% 22.4-32.7) prevalence of malnutrition/risk of malnutrition (39). The prevalence of FI in studies of Brazilian community-dwelling older adults varied from 21.8% to 52% (40,41). One recent study conducted in South America (older Colombian adults) observed 55% FI. In an analysis of 22 studies, Pereira *et al*. (7) showed the prevalence ranged from 1.7% in older North American adults to 76.3% in older Greek adults. That is, given a heterogeneous aging process between countries and social classes, being an older adult is a risk factor for FI and malnutrition, especially among community dwellers.

Community-dwelling older adults experiencing FI who are treated in social programs such as the FHS generally present a social, health, and dietary situation that can cause a greater chance of them developing malnutrition. Social vulnerability is perceived that primarily hinders access to and the stability of an adequate and healthy diet, in the face of so many other priorities (36,38,43). In addition, there is a combination of aspects related with the health condition of older adults, such as the physiological repercussions of aging itself, as well as those derived from pathological processes, which influence the older adult's diet and can affect their NS (44). Moreover, older adults experiencing FI present an unstable and insufficient dietary pattern that may not meet the nutritional recommendations (7,45). To mitigate this situation, many older adults resort to social programs, such as income transfer programs, community restaurants, food banks, and meal distributions (41,46).

In spite of the effort employed in all the stages of the research, the study presents some limitations. One of these relates to the use of the EBIA, which places more emphasis on assessing aspects related to the access to foods dimension; as well as using households/families with older adults as an analysis unit, and not necessarily the older individual (30). Nonetheless, the scales or questionnaires based on the family experience of FI and hunger are the most widely used instruments for assessing the topic and focus on the acquisition of foods, due to the robust scientific evidence, which considers economic aspects to be the most relevant in determining FI (47). On the other hand, we highlight the strengths of the study: 1) it focuses on community-dwelling older adults who use the FHS and PHC; 2) as far as we know, it is the first study on the topic in Brazil, conducted using a representative sample of older adults from the FHS; 3) it uses the MNA to assess malnutrition, which is a multidimensional instrument that is widely used in research and in nutritional assistance, and which considers the specificities of aging (25).

Conclusion

There is an association between food insecurity and malnutrition/risk of malnutrition in older adults attended to under the Family Health Strategy, with moderate/severe FI standing out. In addition, this study indicates that households with older adults registered with the FHS present high prevalences of both food insecurity and malnutrition, possibly due to the vulnerabilities present in the individual and collective context of these individuals. Finally, the results include FI as one of the determinants of malnutrition among community-dwelling older adults, together with other social, health, and nutritional aspects, which are already well-established in the literature.

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Conflict of Interest

The authors declare they have no conflict of interests.

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