Food insecurity and depressive symptoms among older adults assisted by the Family Health Strategy in the Northeast region of Brazil

Insegurança alimentar e sintomas depressivos em idosos atendidos pela Estratégia Saúde da Família na Região Nordeste do Brasil

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ABSTRACT

Objective

This study aimed to investigate the association between depressive symptoms and food insecurity in households with older adults.

Methods

This is a cross-sectional, quantitative study conducted with community-dwelling older adults attended to in the Family Health Strategy in a municipality in the Brazilian Northeast. Depressive symptoms were evaluated using the Geriatric Depression Scale and food insecurity was assessed using the Brazilian Food Insecurity Scale. The chi-squared test was applied for a bivariate analysis and binary logistic regression was used to verify the association between depressive symptoms and food insecurity, adjusted for potential confounding variables. The significance level was $p<0.05$.

Results

A total of 316 older adults were evaluated, with a mean age of 70.5 (±7.5 years). The prevalence of depressive symptoms was 27.5% and that of food insecurity was 63.3%, with 25.6% of

households with older adults experiencing moderate/severe insecurity. In the multivariate analysis, households experiencing mild food insecurity presented 3 times (OR: 3.02; 95% CI: 1.42-6.39) more chance of developing depressive symptoms, while in those experiencing moderate/severe food insecurity the chance was 5 times higher (OR: 5.01; 95% CI: 2.30-10.92).

Conclusion

An association was found between food insecurity and depressive symptoms in households with older adults of the Family Health Strategy, with more chances for those experiencing moderate/severe food insecurity.

Keywords: Aged. Depression. Family health. Food security. Mental health.

RESUMO

Objetivo

Investigar a associação entre sintomas depressivos e insegurança alimentar em domicílios com idosos.

Métodos

Estudo transversal, quantitativo e realizado com idosos comunitários atendidos na Estratégia Saúde da Família em um município do Nordeste brasileiro. Sintomas depressivos foram avaliados pela Escala Geriátrica de Depressão; e a insegurança alimentar, com a Escala Brasileira de Insegurança Alimentar. Foi aplicado o teste qui-quadrado para análise bivariada e a regressão logística binária para verificar a associação entre sintomas depressivos e insegurança alimentar, ajustada por potenciais variáveis de confundimento. O nível de significância foi p<0,05.

Resultados

Foram avaliados 316 idosos, com média de idade de 70,5 (±7,5 anos). A prevalência de sintomas depressivos foi de 27,5% e a de insegurança alimentar foi de 63,3%, sendo que 25,6% dos domicílios com idosos estavam em insegurança moderada/grave. Na análise multivariada, domicílios com insegurança alimentar leve apresentaram 3 vezes (OR=3,02; IC 95%1,42-6,39) mais chances de desenvolverem sintomas depressivos, enquanto que aqueles em insegurança alimentar moderada/grave a chance foi 5 vezes maior (OR=5,01; IC 95% 2,30-10,92).

Conclusão

Foi encontrada associação entre insegurança alimentar e sintomas depressivos em domicílios com idosos da Estratégia Saúde da Família, com mais chances para aqueles com insegurança alimentar moderada/grave.

Palavras-chave: *Idosos. Depressão. Saúde da família. Segurança alimentar. Saúde mental.*

INTRODUCTION

Food Insecurity (FI) is understood as instability in the acquisition of foods and can be an acute or chronic condition that can manifest through a lack of foods or financial resources to maintain an adequate and healthy diet. It is presented both at an individual and family/household level and can be classified as mild, moderate, or severe [1].

Among older adults, because of the aging process itself, FI can become even more severe, given the social, economic, family, physiological, cognitive, and functional alterations that can impair access to and the consumption of food [2]. In this context, households with older adults experiencing FI present a reduction in the quality and quantity of foods consumed and, consequently, deterioration in their dietary pattern, with repercussions for health in general [3,4]. With this irregularity and concern regarding the acquisition of food, FI represents a trigger for common mental disorders, especially Depressive Symptoms (DS) [5,6].

Depression, one of the most common psychiatric problems, is a disorder of the affective region or mood, characterized by a lack of control over one's emotional state [7]. It has major functional repercussions in older adults, increasing psychological distress, worsening pre-existing pathological processes, causing a loss of autonomy, and increasing the risk of mortality [8,9]. Depression causes symptoms that reflect emotional states: anxiety, sleep instability, sadness, loss of energy, lack of

willingness, lack of interest in leaving the house, dwelling on the past, and a feeling of contempt towards one's family, among others [10]. Many of these symptoms are frequent among households experiencing FI [11].

The prevalence of DS in community-dwelling older adults in Brazil is close to a quarter of the population, with variations depending on the assessment instrument used, the region the study is conducted, and the socioeconomic level of the older adults analyzed [12]. As it is multicausal in nature, depression is associated with social factors (poverty, loneliness, social support), biological factors (fragility, alterations in the nervous system), psychological factors (the loss of loved ones and changes in social roles), as well as nutritional and dietary outcomes, such as FI [6,13,14]. In addition, there is no consensus on the causal directionality between DS and FI. That is, difficulties accessing foods may negatively affect control over emotions and mood and poor mental health can alter the dietary pattern of older adults [5,6].

Older Brazilian adults who live in poor communities generally use the Unified Health System, especially the Family Health Strategy (FHS). This allows access to prevention and health promotion programs and has a positive impact on disease management [15]. However, in many contexts, such as in the Northeast region, these older adults are more exposed to socioeconomic problems such as poverty, illiteracy, unemployment, and social isolation, leading to situations of depression and FI [16,17].

It is known that the condition of FI is complex and can affect the mental health of older adults, depending on the level of intensity (mild, moderate, or severe FI). Thus, given the scarcity of studies with Brazilian older adults on this topic, it is necessary to understand whether FI can be considered a sociodietary marker of depression in older adults assisted by the FHS. Therefore, this study aimed to investigate the association between DS and FI in households with older adults.

METHODS

This is a cross-sectional study conducted with a representative sample of older adults living in their own homes and attended to in the FHS in the municipality of Barreiras, in Bahia, Brazil. The study is linked to a parent project entitled "Health assessment of older adults in the municipality of Barreiras (BA)." The municipality had an estimated population of 156 thousand inhabitants in 2020 and occupies a prominent place in Brazilian food production [18]. Nonetheless, an assessment of the Food Security (FS) situation at a municipal level revealed that the population of Barreiras was exposed to mild FI conditions [19].

In this study, the target population was composed of older adults (≥60 years old) registered with the FHS, which is considered the entry point in the Unified Health System. The FHS cover in Barreiras was 52.5% in 2018, that is, 4,828 older adults spread over the Family Health Units in the period the research was conducted. A general prevalence of 50% was considered for the sampling calculation of the parent project, a 5% error, and 95% confidence interval, totaling a sample of 356 participants.

We also chose to calculate the power of the study, using the OpenEpi software (OpenEpi, Atlanta, Georgia), as the sample of the parent project was not estimated to investigate the outcome of this study. Thus, considering a 99% test power and 5% significance level, the sample of older adults enabled us to identify an Odds Ratio (OR) of 4.1, with a prevalence in the exposed subjects of 36% and among the non-exposed subjects of 12%.

To choose the study participants, we initially carried out stratified random sampling with proportional allocation. In this stage, to calculate the number of older adults in each stratum we considered the 23 territories covered by the FHS teams, in order to ensure the representativeness of the sampling process. Next, to obtain the nominal list of older adults who were interviewed in each FHS team, we carried out simple random sampling.

As inclusion criteria we chose older adults aged 60 or over, of both sexes, who were urban dwellers and attended to in the FHS. We excluded the following: institutionalized or hospitalized older adults; those affected by some health condition that prevented them from traveling to the data collection site; and older adults with cognitive impairment, identified by the FHS team, which prevented them from filling in the answers to the research questionnaire.

This study was approved by a Research Ethics Committee, under decision nº 1.447.361/2016, CAAE 49867715.7.0000.5026. The older adults' adhesion to the research was voluntary and depended on their signing or fingerprinting the informed consent form. All the participants were informed of the research objectives and procedures.

The data were collected directly from the older adults, by a trained and standardized multiprofissional team, in the period from February of 2017 to August of 2018. The individuals chosen received an invitation at their homes, delivered by the Community Health Agents who made up the FHS teams. The invitation provided information about the study and guidelines for the data collection. If the older adult was absent from their residence, the Community Health Agents were directed by the study team to make a second attempt at recruitment. Those who did not accept to participate in the research were replaced by the next available name on the list of older adults registered with the FHS. The older adults not found, those who refused to participate after being invited, and the individuals who did not attend on the day scheduled for the interview were considered as participant losses at the time of the data collection.

The collection was carried out using the Geriatric Depression Scale (GDS-15) and the Brazilian Food Insecurity Scale. In addition, to better understand the association between DS and FI, some covariables were collected and analyzed using the general questionnaire of the study.

The DS were assessed using the GDS-15 [20]. This instrument is validated and widely used for tracking that outcome and is applied in various environments (community, outpatient units, hospitals, and nursing homes), including the Primary Health Care (PHC) spaces [21,22]. After applying the 15 dichotomous (yes/no) questions, the GDS detects reduced self-esteem, anxiety, social isolation, lack of energy, loss of morale, and lack of hope. Each positive answer corresponds to 1 point on the scale and, at the end of its application, the GDS enables the individuals to be classified into two groups: older adults without DS (<6 points) and older adults with DS (≥6 points) [20,23].

The FI was measured using the Brazilian Food Insecurity Scale, which is a psychometric scale for evaluating the family/household perception and experience in relation to FI and hunger, considering the difficulties accessing foods [24]. It has been a widely used tool since it was translated, adapted, and validated for the Brazilian population [25,26]. After applying the scale, the households with older adults are classified into four levels: FS, mild FI, moderate FI, and severe FI, where the reference values consider the presence or absence of under 18s. That is, in situations without individuals <18, we used the classifications FS (0 points), mild FI (1-4 points), moderate FI (5-6 points), and severe FI (7-8 points); and with individuals <18, we used the classifications FS (0 points), mild FI (1-5 points), moderate FI (6-9 points), and severe FI (10-14 points) [24].

To characterize the sample we collected information on sex (male or female), age (60 to 69, 70 to 79, or ≥80), race/color (black/brown, white, yellow, indigenous, or others), schooling (<4 or ≥4

years of study), marital status (with a partner or without a partner), religious practice (yes or no), presence of a minor in the household (yes or no), pension program (yes or no), alcohol consumption (yes or no), smoking (yes or no), and engagement in physical activity (yes or no). In relation to health conditions, we collected information about quantity of prescription drugs (<3 or ≥3 prescription drugs) and recent hospitalization (yes or no). All these elements were self-reported and collected through the research questionnaire.

All the analyses were conducted with the help of the SPSS®IBM® (version 20.0.) We conducted a descriptive analysis to identify the profiles of the population according to DS and FI. For that, we used the (absolute and relative) frequency distributions together with the chi-squared test, since all the variables analyzed were categorical. At that point, the outcome was categorized as with DS or without DS. The exposure (FI), in turn, was categorized as FS or FI. The variables that presented statistical significance lower than 0.20 in the bivariate analysis were included in the multivariate model.

The multivariate analysis was conducted using binomial logistic regression to assess the association between DS (with and without) and the different levels of FI (FS, mild FI, and moderate/severe FI). In model I we only considered the FI variable. In model II, besides FI, we added sociodemographic variables. In model III, in turn, together with the variables from models I and II, we included the aspects linked to lifestyle and health conditions. With that we obtained as association measures the crude and adjusted OR with their respective 95% confidence intervals (95% CI). In all the analyses we considered α=0.05 to determine statistical significance.

RESULTS

We evaluated 316 older adults (11.2% losses), mostly of the female sex (61.7%) and with a mean age of 70.5 years old (±7.5). The prevalence of DS was 27.5% and that of FI was 63.3% (37.7% mild FI and 25.6% moderate/severe FI). Among the main characteristics of the sample, we observed that most were black or brown (51.9%), had a low level of schooling (72.8%), had a partner (51.6%), practiced some religion (90.5%), and were beneficiaries of pension programs (85.1%). In terms of lifestyle, 13.9% of the older adults consumed alcohol, 10.8% were smokers, and 40.5% did not engage in any physical activity. In relation to health conditions, in turn, 47.9% used three or more prescription drugs daily and 9.8% reported hospitalization in the last 12 months (Table 1).

Table 1 – Sample characterization according to depressive symptoms in Brazilian community-dwelling older adults. Barreiras (BA), Brazil, 2017-2018.

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Variables	Total		Depressive symptoms				p-value
			Without symptoms		With symptoms		
	n	%	n	%	n	%	
Sex							
Female	195	61.7	132	67.7	63	32.2	0.016*
Age (years)							
60-69	172	54.4	124	72.1	48	27.9	0.975
Race/color							
Black/brown	164	51.9	118	72.0	46	28.0	0.700
Schooling							
<4 years	230	72.8	152	66.1	68	33.9	<0.001*
Marital status							
With a partner	163	51.6	128	78.5	35	21.5	0.013*

Table 1 – Sample characterization according to depressive symptoms in Brazilian community-dwelling older adults. Barreiras (BA), Brazil, 2017-2018.

Variables	Total		Depressive symptoms				p-value
			Without symptoms		With symptoms		
	n	%	n	%	n	%	
Religious practice							
Yes	286	90.5	210	73.4	76	26.6	0.239
Minor in the household							
No	231	73.1	173	74.9	58	25.1	0.112
Pension program							
Yes	269	85.1	194	72.1	75	27.9	0.739
Alcohol consumption							
No	272	86.1	193	71.0	79	29.0	0.135
Smoking							
No	282	89.2	207	73.4	75	26.6	0.283
Physical activity							
No	188	59.5	122	64.9	66	35.1	<0.001*
Prescription drugs							
≥3	151	47.9	111	73.5	40	26.5	0.756
Hospitalization (12 months)							
No	285	90.2	208	73.0	77	27.0	0.535
Food insecurity							
Food security	116	36.7	102	87.9	14	12.1	
Mild food insecurity	119	37.7	85	71.4	34	28.6	
Moderate/severe food insecurity	81	25.6	42	51.9	39	48.1	<0.001*

Note: *Significance level ($p<0.05$).

In the bivariate analysis there was a statistically significant association between these two main conditions of interest in the study, DS and FI ($p<0.001$). Besides FI, DS were associated with the variables sex ($p=0.016$), schooling ($p<0.001$), marital status ($p=0.013$), and engagement in physical activity ($p=0.000$) (Table 1). In the multivariate analysis, after adjusting for possible confounding

Table 2 – Binomial logistic regression model predicting the association between depressive symptoms and food insecurity in Brazilian community-dwelling older adults. Barreiras (BA), Brazil, 2017-2018.

Variables/categories	Model I		Model II		Model III	
	OR	95% CI	OR	(95% CI)	OR	(95% CI)
Food insecurity						
Mild food insecurity	2.91	(1.46-5.78)*	3.18	(1.52-6.64)*	3.02	(1.42-6.39)*
Moderate/severe food insecurity	6.76	(3.33-13.74)*	5.63	(2.61-12.11)*	5.01	(2.30-10.92)*
Sex						
Female			1.79	(0.98-3.27)	1.76	(0.94-3.29)
Age (years)						
70 to 79			0.72	(0.39-1.32)	0.67	(0.36-1.26)
80 or more			1.18	(0.48-2.89)	1.12	(0.45-2.75)
Schooling						
<4 years			4.08	(1.85-9.00)*	3.81	(1.71-8.49)*
Marital status						
Without a partner			1.22	(0.69-2.19)	1.18	(0.66-2.13)
Minor in the household						
Yes			1.31	(0.72-2.38)	1.27	(0.69-2.32)
Alcohol consumption						
Yes					0.66	(0.27-1.61)
Physical activity						
No					2.05	(1.12-3.77)*

Note: *Significance level ($p<0.05$). OR: Odds Ratio. 95% CI: 95% confidence interval.

variables, the association between DS and FI remained statistically significant in all the logistic regression models, where in the final model (III) mild FI presented an OR of 3.02 (95% CI=1.42-6.39) and moderate and severe FI presented an OR of 5.01 (95% CI=2.30-10.92) (Table 2). In addition, older adults with fewer than four years of study (OR=3.81, 95% CI=1.71-8.49) and who did not engage in physical activity (OR=2.05, 95% CI=1.12-3.77) also presented more chance of developing DS.

DISCUSSION

The results of this study indicated an association between FI and the presence of DS in community-dwelling older adults attended to in the FHS in a municipality in the Northeast of Brazil. Households with older adults experiencing mild FI presented approximately three times more chance of developing DS, while those who found themselves in a moderate or severe situation had five times more chance compared with households in a FS situation. That is, the worse the FI situation was, the greater the chance of the older adult presenting a clinical picture suggestive of depression.

Evidence that confirms the results of the study was found in a global analysis regarding FI and mental health involving 149 countries, where FI was associated in a dose-response way with worse mental health situations [27]. In a meta-analysis study that considered all life cycles, Pourmotabbed et al. [6] showed that there is an association between FI and depression, where older adults present a greater risk compared with younger individuals. Thus, FI can be considered a predictive source for depression in older adults [28-30].

This study indicated a high prevalence of both DS and FI. In relation to DS, a systematic review involving articles on patients monitored in outpatient units identified different prevalence rates of DS between the age groups of the older population: 60 to 70 (20%), 70 to 80 (27%), and 80 to 90 (34% DS) [31]. In a meta-analysis carried out with 33 studies involving Brazilian community-dwelling older adults, Meneguci et al. [12] identified a slightly higher prevalence (21%) than that found in this study. In relation to FI, in turn, the literature shows a large variation in prevalence, a reflection of the living conditions of older adults and the different strategies available for them to access foods, varying from 1.7% (United States) to 76.3% (Greece), according to Pereira et al. [4]. Both in FI and in DS, this variation in prevalence also occurs due to the conceptual complexity of the phenomena and of the various instruments for measuring them [6,12].

Food can provide an important link for good memories and moments of joy and pleasure in daily life, especially when so much changes through the aging process (economic situation, autonomy, family structure, functionality, and social capital). Food involves emotions, memories, and feelings about people, moments, and places that are relevant to the older adult's past, especially when food is more abundant [32,33]. However, older adults in a FI situation are also denied these feelings related to food, given that the priority in accessing and consuming foods is to escape from hunger [2,34]. Thinking about a healthy and (socially and culturally) adequate diet ceases to be a priority and for that reason familiar foods that bring pleasure are substituted for those that fit the domestic budget.

In this context, households with older adults in a FI situation may be more exposed to DS [6]. The profile of an older adult who is vulnerable to these conditions (FI and DS) is generally common: female sex, low level of schooling, insufficient income, lives alone, smoker, presence of comorbidities, polypharmacy, and with functional and cognitive limitations [2,11,35,36]. Many of these aspects also make up the profile of the community-dwelling older adults who live in the Northeast of Brazil and receive care through the FHS [17,37].

Given this lack of dietary stability, such a basic need for human dignity, DS emerge due to increased anxiety and stress caused by dietary uncertainty; impotence, shame, and guilt, when the acquisition of food occurs atypically; and fear of hunger [27,38]. In addition, an insufficient intake in the long run can result in a deficiency of some micronutrients with oxidant functions that would protect against depression, attenuating possible neuronal damage in the hippocampus region [39]. This deficient and scarce consumption activates mechanisms that raise cortisol levels, which increases the degree of stress of these individuals [40]. In addition, exposure to high levels of stress can cause dysfunction of the hypothalamic-pituitary-adrenal axis, which would increase the chance of DS appearing [41]. These two pathways, one pychosocial and the other endocrinometabolic, are indicated for explaining the relationship between DS and FI [27,38-40].

The study also showed that severe FI greatly increases the chance of the older adults presenting DS. In a study involving community-dwelling older adults from six low and middle income countries, Smith et al. [40] found evidence that only the older adults in a severe FI situation had more chance of depression. Severe FI is marked by increased psychological distress of the older adults who live in that condition [36]. In an even worse situation are those who live alone, as they are more likely to present DS [35,42].

The findings of this study indicate challenges in public health, revealing that the approach to these individuals attended to in PHC needs to occur in an integrated way [43,44]. Only holistic care will be able to perceive the connections that exist in the health-disease process of the older adults, such as the one that exists between mental health and diet. Viable assessment tools could be included in PHC consultations, facilitating the identification of FI and DS situations, given that these conditions could have major impacts over other aspects of the older adult's life. In addition, there is a perceived need to bring the health and social care systems together, in order to create a network of public facilities for dealing with FI and DS formed of health units, social care, income transfer programs, popular restaurants, food banks, nursing homes, and therapy and recreation groups, among others.

Even given the methodological rigor applied throughout this study and the results having shown a strong association between DS and FI, it is not possible to make affirmations about causality between FI, as an exposure, and DS, as an outcome. Some studies indicate the possibility of an two-way association, since DS can also produce FI situations [6,39]. The scarcity of longitudinal studies adds to not elucidating this question among older adults, and research conducted in other populations already indicates this two-directionality between FI and mental health [5,6]. Another limitation involves the application of the GDS, an instrument for tracking depression [22]. Despite not diagnosing this mental condition, the GDS is one of the most used instruments in the scientific literature, with it being adapted and validated in dozens of countries [23]. In relation to the merits, we can highlight the study's focus on community-dwelling older adults attended to in PHC; the use of consolidated instruments to assess the main conditions analyzed; as well as it being, as far as we know, the first study on this topic in South American older adults.

CONCLUSION

It was possible to observe in this study that there is an association between FI and DS in older adults of the FHS, both with mild FI and with moderate/severe FI. The study also highlighted the high prevalence of both FI and DS, possibly due to the vulnerabilities present in the individual and collective contexts of PHC users. Finally, together with other aspects already established in the literature, the results could include FI as a sociodietary marker of DS in Brazilian community-dwelling older adults.

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