Factors associated with food and nutrition insecurity in a needy community

Fatores associados à insegurança alimentar e nutricional em comunidade carente

Factores asociados con la inseguridad alimentaria y nutricional de una comunidad desfavorecida

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ABSTRACT

Objective: To verify the factors associated with Food and Nutrition Insecurity (FNI) in a needy community. **Methods**: This analytical cross-sectional study was conducted from August to September 2018 with 150 people from a needy community in São Luís, Maranhão, Brazil. Participants were 18 years old, of both sexes, and lived in households in the chosen community. No more than one person per household was included. A questionnaire was used to obtain sociodemographic data (sex, age, education, income, skin color, number of people living in the household, marital status and occupation). Food and nutrition insecurity status was assessed by the Brazilian Food Insecurity Scale, which measures family's perception and experience of food security, insecurity and hunger in the household and classifies the household as either food security or food insecurity (mild, moderate or severe). Multivariate analysis was performed using the Poisson regression model. **Results**: The prevalence rate of FNI was 94% (n=141) in the people analyzed. Regarding income, 70.7% (n=106) of the participants had a monthly income of less than one minimum wage. As for education, 50.7% (n=76) of the participants reported having less than eight years of study. There was an association between household income of less than one minimum wage (IRR=1.07; CI=1.07-1.31) and FNI. **Conclusion**: The prevalence of food insecurity was high among the people analyzed and it was associated with lower income.

Descriptors: Food and Nutrition Security; Risk Factors; Social Vulnerability.

RESUMO

Objetivo: Verificar os fatores associados à insegurança alimentar e nutricional (IAN) de uma comunidade carente. Métodos: Estudo transversal e analítico, desenvolvido nos meses de agosto e setembro de 2018, com 150 indivíduos, em uma comunidade carente de São Luís, Maranhão, Brasil. Participaram da pesquisa maiores de 18 anos, de ambos os sexos e residentes em domicílios na comunidade escolhida. Não foi incluído mais de um indivíduo por domicílio. Aplicou-se um questionário para obtenção de dados sociodemográficos (sexo, idade, escolaridade, renda, cor da pele, número de moradores da residência, estado civil

e ocupação). A situação de insegurança alimentar e nutricional foi avaliada com auxílio da Escala Brasileira de Insegurança Alimentar, que mede a percepção e a experiência familiar da segurança alimentar, insegurança e fome em nível domiciliar, classificando o domicílio em segurança ou insegurança alimentar (leve, moderada ou grave). Realizou-se análise multivariada pelo modelo de regressão de Poisson. **Resultados:** *A prevalência de IAN foi de 94% (n=141) nos avaliados. No que se refere à renda, 70,7% (n=106) tinham renda mensal menor que um salário mínimo. Quanto à escolaridade, 50,7% (n=76) relataram tempo inferior a oito anos de estudo. Observou-se associação em ter renda familiar menor que um salário mínimo (IRR=1,07; IC=1,07-1,31) com a IAN.* **Conclusão:** *A prevalência de insegurança alimentar foi elevada entre os indivíduos investigados e mostrou-se associada à menor renda.*

Descritores: *Segurança Alimentar e Nutricional; Fatores de Risco; Vulnerabilidade Social.*

RESUMEN

Objetivo: *Verificar los factores asociados con la inseguridad alimentaria y nutricional (IAN) de una comunidad desfavorecida.* **Métodos:** *Estudio transversal y analítico desarrollado en los meses entre agosto y septiembre de 2018 con 150 individuos de una comunidad desfavorecida de São Luís, Maranhão, Brasil. Mayores de 18 años, de ambos los sexos y residentes de domicilios de la comunidad elegida participaron de la investigación. No se ha incluido más de uno individuo de cada domicilio. Se aplicó una encuesta para obtener los datos sociodemográficos (el sexo, la edad, la escolaridad, la renta, el color de la piel, el número de personas de la vivienda, el estado civil y la ocupación). La situación de inseguridad alimentaria y nutricional ha sido evaluada por la Escala Brasileña de Inseguridad Alimentaria que mide la percepción y la experiencia de la familia sobre la seguridad alimentaria, la inseguridad y el hambre a nivel domiciliario clasificándole de seguridad o inseguridad alimentaria (leve, moderada o grave). Se realizó un análisis multivariado por el modelo de regresión de Poisson.* **Resultados:** *La prevalencia de IAN en los evaluados ha sido del 94% (n=141). Sobre la renta, el 70,7% (n=106) tenía la renta mensual de menos de un sueldo mínimo. Respecto la escolaridad, el 50,7% (n=76) ha relatado haber tenido menos de ocho años de estudio. Se observó la asociación entre tener la renta familiar de menos de un sueldo mínimo (IRR=1,07; IC=1,07-1,31) y la IAN.* **Conclusión:** *La prevalencia de inseguridad alimentaria ha sido elevada entre los individuos investigados y se ha asociado con la renta baja.*

Descriptores: *Seguridad Alimentaria y Nutricional; Factores de Riesgo; Vulnerabilidad Social.*

INTRODUCTION

Food and nutrition insecurity (FNI) occurs when a family is unable to regularly and permanently acquire enough quality food or, when they do so, they compromise their access to other essential things[1]. FNI focuses on the feeling of concern and/or anguish in the face of the uncertainty about availability of food, living with hunger and consuming a low-quality, monotonous nutritional diet that fails to meet a person's needs[2].

Brazilian estimates from the 2013 National Household Sample Survey (*Pesquisa Nacional por Amostra de Domicílio - PNAD*) have shown that the Northeast is the region with the highest rate of households facing FNI, i.e., 45 million inhabitants, which is equivalent to 38.1% of the households assessed in Northeastern Brazil[3]. The survey also showed Maranhão as the state with the highest prevalence of FNI (60.9%). This scenario shows the failures in regular and permanent access to quality food in sufficient quantities in that state[4].

According to the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística - IBGE*), the Human Development Index (HDI) of São Luís, Maranhão, improved significantly between 2000 and 2010 (0.658 and 0.768), but the state still faces income inequality, structural problems and people living on the poverty line[5]. Such vulnerability experienced by the population of Maranhão can be explained by the poverty and social inequality that still affects the state and by other socioeconomic and demographic factors that, according to reports, are associated with the FNI of a population, such as household income, number of people living in a household, sex, skin color, education, place of residence and presence/absence of children under 18 years of age at home[6-9].

FNI is associated with poverty and extreme poverty in which individuals live, which can be measured by five methods of analyzing the food and nutrition security (FNS) situation commonly used in nationwide surveys. Some of the main methods include psychometric scales that assess family access to food, such as the Brazilian Food Insecurity Scale (*Escala Brasileira de Insegurança Alimentar - EBIA*)[10].

According to the National Food and Nutrition Security Policy (*Política Nacional de Segurança Alimentar e Nutricional - PNSAN*), put into effect through Law No. 11346 of September 15, 2006, known as the Food and Nutrition Security Organic Law (*Lei Orgânica de Segurança Alimentar e Nutricional - LOSAN*), FNS can be defined as everyone's right to regular and permanent access to quality food in sufficient quantities without compromising their

access to other basic needs, such as education and leisure, and respecting cultural, social and economic diversity in an environmentally sustainable way[11].

Food constitutes one of the basic human rights and is a requirement for meeting all other rights inherent to the very concept and exercise of citizenship. It covers aspects that are not limited only to access to food itself, but to the very context in which people and communities are inserted. It is the State's duty to foster and guarantee such right so that every citizen can live by an essential prerogative of not being afraid of living under the threat of hunger[12].

Therefore, with the aim of guaranteeing healthy and adequate food for all, Brazil uses instruments that are inserted in the National Health Promotion Policy through activities involving healthy eating and health and FNS promotion and supporting actions and goals for poverty reduction, greater social coverage and implementation of the human right to adequate food (HRAF)[13].

Knowing the prevalence of FNI is of great importance for the assessment of living conditions as FNI is worrying and studies in this field may support the creation of public policies to tackle the problem. Given that, this study aimed to verify the factors associated with food and nutrition insecurity (FNI) in a needy community.

METHODS

This analytical cross-sectional study was conducted in August and September 2018 in a needy community in São Luís, Maranhão, Brazil. It is an urban community located on the outskirts of the capital. The non-probability sample consisted of 150 individuals who were in their homes at the time of data collection and who agreed to participate in the study.

Study participants were people over 18 years old of both sexes living in households in the community chosen for the study and who agreed to sign the Informed Consent Form (ICF). The study included no more than one individual per household.

Data were collected through interviews with people living in the households analyzed. We used an adapted questionnaire[14] containing questions on sociodemographic variables (sex, age, education, income, skin color, number of people living in the household, marital status and occupation).

The second instrument used was the Brazilian Food Insecurity Scale (*Escala Brasileira de Insegurança Alimentar - EBIA*) with 15 closed-ended questions applied by IBGE in the PNAD conducted in 2004, 2009 and 2013 to measure the prevalence of households with FNI in the country. It should be noted that the PNAD is the only representative survey in Brazil with available data on FNI[15]. The EBIA is a low-cost and easy-to-apply instrument that measures family perception and experience of food security, food insecurity and hunger at home and that is able to estimate its prevalence in the population[4] and classify the household analyzed for food security or insecurity in three levels: mild, moderate and severe[16].

The EBIA methodology recommends the construction of a score by assigning one point to each positive response. If the household scores zero, it is classified as FNS. There are two different scores for the classification of FNI for households with and without people under 18 years of age. Thus, when the household has only people over 18 years of age, the classification is: from 1 to 3 points - mild food insecurity (MFI); from 4 to 6 points - moderate food insecurity (ModFI); from 7 to 8 points - severe food insecurity (SFI). In households with people under 18 years of age, the classification of levels of MFI, ModFI or SFI corresponds to 1 to 5 points, 6 to 10 points and 11 to 15 points, respectively[4].

The collected data were tabulated and organized in 2010 Microsoft Office Excel® and later transferred to the STATA® software version 12.0 for analysis. Categorical variables were presented as absolute and relative frequencies.

After that, multivariate analysis was performed using the Poisson regression model and all the independent variables (sociodemographic) associated with the event of interest (FNI) with a statistical significance of up to 20% were included in the multiple model. A significance threshold of $p<0.05$ was adopted for the associations selected for the final model.

The present study is part of a major research project approved by the Research Ethics Committee of Ceuma University (*Universidade Ceuma*) (Approval No. 2.627.604).

RESULTS

Of the 150 individuals interviewed, 68.7% (n=103) were women, 54.7% (n=82) lived with a partner and 44% (n=66) reported being unemployed. Households with people aged 18 to 29 years represented 50% (n=75) of the

sample. With regard to income, 70.7% (n=106) of the participants had a monthly income of less than one minimum wage. More than half of the individuals (54.7%; n=82) lived in households composed of one or three members. As for education, 50.7% (n=76) of the participants reported having less than eight years of study. Regarding self-declared race, 46.7% (n=70) of the individuals declared themselves *Pardo* (mixed-race Brazilians) (Table I).

Table I - Distribution of the participants according to sociodemographic conditions. São Luís, Maranhão, 2019.

Variable	n	%
Sex		
Men	47	31.3
Women	103	68.7
Marital Status		
With a partner	82	54.7
Without a partner	68	45.3
Age (years)		
18 – 29	75	50.0
30 – 59	55	36.7
≥ 60	20	13.3
Occupation		
Studying	5	3.4
Working	56	37.3
Unemployed	66	44.0
Retired/pensioner	23	15.3
Income		
< 1 minimum wage	106	70.7
1 – 5 minimum wages	44	29.3
Number of people living in the household		
1 – 3	82	54.7
4 – 6	57	38.0
7	11	7.3
Education		
Incomplete and complete primary education	76	50.7
Incomplete and complete secondary education	52	34.7
Incomplete and complete higher education	22	14.6
Skin color		
White	24	16.0
Pardo	70	46.7
Black	56	37.3
Total	150	100.0

A total of 94% (n=141) of the individuals assessed experienced some level of food and nutrition insecurity. Mild insecurity was the most frequent and affected 35.3% (n=53) of the sample (Figure 1).
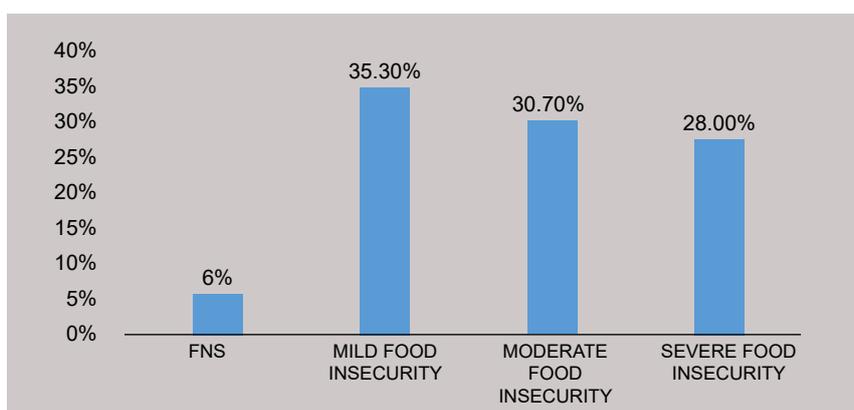

Figure 1 - Food and nutrition (in)security experienced by people living in a needy community. São Luís, Maranhão, 2019.

In the unadjusted analysis, being 30 to 59 years old (IRR=1.05; CI=0.98-1.12), working (IRR=0.94; CI=0.88-1.00), being unemployed (IRR=0.95; CI=0.90-1.00), being a pensioner/retired (IRR=0.94; CI=0.88-1.00) and having a household income below one minimum wage (IRR=0.86; CI=0.74-1.01) were associated with FNI (Table II).

Table II - Unadjusted analysis of the association of sociodemographic characteristics with food and nutrition insecurity in people living in a needy community. São Luís, Maranhão, 2019.

Variable	IRR	CI (95%)	p-value
Sex			
Men	1	-	1
Women	1.03	(0.94-1.14)	0.432
Marital Status			
With a partner	1	-	1
Without a partner	1.04	(0.97-1.12)	0.206
Age (years)			
18 – 29	1	-	1
30 – 59	1.05	(0.98-1.12)	**0.160**
≥ 60	0.91	(0.74-1.10)	0.346
Occupation			
Studying	1	-	1
Working	0.94	(0.88-1.00)	**0.089**
Unemployed	0.95	(0.90-1.00)	**0.084**
Retired/pensioner	0.86	(0.74-1.01)	**0.085**
Income			
1 – 5 wages	1	-	1
< 1 wages	1.07	(1.01-1.31)	**0.017**
Number of people living in the household			
1-3	1	-	1
4-6	1.00	(0.92-1.09)	0.834
7 or more	0.96	(0.79-1.17)	0.745
Education			
Incomplete and complete higher education	1	-	1
Incomplete and complete primary education	1.00	(0.90-1.11)	0.905
Incomplete and complete secondary education	0.94	(0.83-1.07)	0.402
Skin color			
White	1	-	1
Pardo	1.28	(0.89-1.17)	0.681
Black	1.03	(0.90-1.18)	0.646

IRR: Relative Risk; CI: Confidence Interval

In the adjusted analysis, income below one minimum wage was associated with FNI experienced by individuals (IRR=1.07; CI=1.07-1.31), with no significant associations between other study variables (Table III).

Table III - Adjusted analysis of the association of the sociodemographic characteristics with Food and Nutrition Insecurity in people living in a needy community. São Luís, Maranhão, 2019.

Variable	IRR	CI (95%)	p-value
Age (years)			
18-29	1	-	1
30-59	1.05	(0.97-1.13)	0.155
≥ 60	0.95	(0.82-1.11)	0.589
Income			
1-5 wages	1	-	1
< 1 wage	1.07	(1.01-1.31)	**0.017**
Occupation			
Studying	1	-	1
Working	1	-	1
Unemployed	0.93	(0.87-1.00)	0.071
Retired/Pensioner	0.89	(0.78-1.00)	0.057

IRR: Relative Risk; CI: Confidence Interval

DISCUSSION

The present study found a high prevalence of FNI in the families analyzed. Such prevalence is higher than that found in the PNAD[3], in which 60.9% of the population of Maranhão experienced FNI. It should be noted that the community analyzed in the present study is located in a peripheral region of the city of São Luís, Maranhão, which may have influenced the study outcome.

Studies carried out in the Northeast region have also highlighted a high prevalence of FNI, as in the study carried out in four settlements located in Sergipe[17], which revealed that 88.8% of the families experienced FNI, with 40.2% them experiencing ModFI and SFI. In the city of Teresina, Piauí, the prevalence rate of FNI in families assisted by the Family Health Strategy was 65%[18]. In the municipality of Queimadas, Paraíba, 65.4% of the 204 families assessed experienced FNI[19]. In a study carried out in Maranhão[20], only 29.6% (n=283) of the children experienced food security and 70.4% (673) of them experienced some type of food insecurity.

A study that assessed food and nutrition (in)security according to socioeconomic and nutritional indicators in families living in rural areas of Minas Gerais[21] found 49.4% of families experiencing FNI according to EBIA and concluded that these indicators need to be incorporated in primary care so that public policy strategies to tackle the difficulties encountered can be developed.

The families that participated in the present study had some peculiarities: half of the individuals interviewed were adolescents over 18 years old and young adults up to 29 years old who were unemployed, came from other municipalities in the state of Maranhão, and had a household income below one minimum wage and other characteristics that may have influenced the results.

The fight against FNI in the most vulnerable groups is part of the challenges of the II National Plan for Food and Nutrition Security (*Plano Nacional de Segurança Alimentar e Nutricional - PLANSAN*) whose goal is to identify the groups and territories most vulnerable in terms of FNS by mapping food and nutrition insecurity with the aim of assisting public policies in improving conditions of access to food for those who are still vulnerable[22]. Therefore, there must be an intersectoral articulation of PLANSAN at the municipal level to promote actions targeted at this population group as we found a high number of families experiencing food insecurity in the studied community.

The analysis of the factors associated with food insecurity among the individuals in the community assessed in the current study showed that income was associated with the FNI. However, we obtained a borderline value for the association between occupation and FNI. In a systematic review that carried out a meta-analysis of studies on FNS using the EBIA conducted in Brazil[23], household income was the variable that was most associated with FNI among the studies analyzed.

Most of the participants interviewed in the present study earned less than one minimum wage, thus demonstrating the precarious economic condition in which this population lived, which would possibly not allow decent conditions for food. Similar data were found in a study conducted in the municipality of Diamantina, Minas Gerais, which found that families with an income below one minimum wage were 1.8 times more likely to experience ModFI SFI[24]. A study[25] that evaluated 978 families in 21 municipalities in the state of Maranhão and in the capital São Luís found that families that survived on less than half the minimum wage (per capita) had almost twice the risk of experiencing food insecurity. Low income hinders adequate access to safe and nutritious food[26].

Regarding occupation, almost half of the interviewees in the current study were unemployed. Unemployment adversely impacts access to food as being employed is a guarantee of some source of income and support for families. In assessing the association of food insecurity with demographic and socioeconomic conditions in households in Campinas, São Paulo[27], researchers found that one of the conditions associated with MFI was the head of the family being unemployed for more than six months. In addition, ModFI and SFI were associated with informal employment of the head of the family, which differs from what was found in the present study, in which no association between FNI and unemployment was observed. The relevance of financial stability lies in, among other aspects, the possibility of regular and permanent access to food for all individuals[28].

In 2016, Brazil signed the Sustainable Development Goals (SDGs), which foresees, in goal 2, the end of hunger by 2030 making sure all people have access to safe, nutritious and sufficient food all year round[29]. However, the present study found a worrying scenario of FNI in the municipality of São Luís. In that context, food and nutrition education (FNE) through the full use of food is a strategy that must be developed in that community considering that many interviewees were unemployed or earned less than one minimum wage, which affected the purchase of sufficient food and/or access to quality food. This strategy can improve the nutritional quality of the diet of this population[30]. However, for the correct implementation of this action, families must be guided and trained regarding the full use of food.

A finding that drew attention in the present study was the borderline value obtained for the association between FNI and being retired/pensioner (IRR=0.94; CI=0.88-1.00; p<0.057). This was probably due to the fact that that most families depended on the retirement of older people. For some families, retirement is their only source of income.

There was higher percentage of men as heads of household among the interviewees in the present study, which may have been associated with better opportunities in the labor market for men, higher income and more prestigious jobs while women were in charge of caring for children and household chores, thus staying at home. However, the number of families headed by women has increased[31] and therefore women in the present study were the only ones responsible for the household income.

With regard to marital status, there was a higher percentage of individuals who lived with a partner in our study. Marital status was not associated with FNI. This finding is in line with that reported in a study carried out with families of preschoolers in the rural area of a municipality in the Vale do Paraíba in São Paulo[32], in which mothers' marital status did not interfere in the family's food insecurity condition. However, a national survey carried out by the Brazilian Institute of Social and Economic Analysis (*Instituto Brasileiro de Análises Sociais e Econômicas - IBASE*)[33] with 5,000 members of the Family Allowance (*Bolsa Família*) program found a 29.6% prevalence rate of FNI in families whose mothers had a spouse. Additionally, the survey found that ModFI (36.31%) and SFI (24.37%) were more pronounced among mothers who had no spouses.

Age was not associated with FNI in the present study, unlike what was observed in a study carried out in the state of Ceará[34] that found an association between food insecurity and age, with a higher prevalence of SFI in the group of people under 18 years old. The presence of people under 18 in the household influences and is associated with FNI, but this relationship only exists when there is no control over the effect of other factors involved in determining the FNI, such as the number of people in the household[35].

The community analyzed herein is characterized by family arrangements consisting of more than one person in the household, following the trend of traditional Brazilian families. In our study, the number of people in the household was not associated with the FNI, but in a study carried out to assess food security and its determinants in Consortium-member municipalities[9], households with seven or more people were 3.19 times more likely to have families experiencing ModFI or SFI. Another study[36] also found food insecurity to be associated with a larger number of people per household. These findings differ from those found in the present study, possibly because it is a current trend in smaller families. According to data PNAD data, a typical Brazilian family is composed on average of three members[37].

Education was not associated with FNI in the current study. This finding is similar to that of a study of nursing mothers attending Primary Health Care (PHC) centers in the municipality of Santa Maria, Rio Grande do Sul, where MFI and the ModFI remained similar regardless of the level of education of the women analyzed[38]. However, it differs from that found in a study with 243 families in the municipality of Viçosa, Minas Gerais, where there was an association between maternal education and food insecurity as mothers who had less than 7 years of study presented a 1.4-fold increased risk of food insecurity compared with those with more than 7 years of study[39].

As for skin color, most of the participants in the present study declared themselves *Pardo* (mixed-race Brazilians) or Black. According to the IBGE, blacks are the majority in Maranhão - 74% of the population[37]. A study that assessed the prevalence and factors associated with FNI in families living in a popular neighborhood in the municipality of Santo Antônio de Jesus in the Recôncavo Baiano[40] found that 84.3% of them were *Pardo* and that skin color was associated with FNI, with the prevalence of FNI being significantly higher in families in which the reference people declared themselves Black (p=0.037). This finding is statistically different from that of our study as we did not find any associations between FNI and skin color.

Some limitations in the development of this study should be highlighted. During the application of the questionnaires at the interviewees' home, answers were often given with some distrust and embarrassment. In order to minimize such bias during data collection we explained the objectives and the importance of the study. The participants answered the questions as they felt more secure. Another limitation to consider is the cross-sectional design of the study, which makes the analysis of causal association difficult.

One strength of our study was the use of EBIA, an easy-to-apply and easy-to-analyze instrument adapted for the Brazilian population that can characterize families at different levels of FNI. In addition to being easily understood by the interviewees and having a low cost, EBIA is frequently used in studies, including national surveys, which assigns greater reliability to the results.

Our findings can assist in the development of strategies such as transforming vacant lots into community crops to improve the FNI scenario of this population given the living conditions of these individuals. This could change the current vulnerability scenario.

CONCLUSION

The prevalence of food insecurity was high and there was a higher rate of MFI. However, the sum of the rates of moderate and severe food insecurity represented half of the sample, which suggests that the participants did not have access to food in quantities and quality adequate to their needs, thus demonstrating the social vulnerability in which they live. FNI proved to be associated with low income and a problem of great magnitude that affected those people analyzed.

CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

CONTRIBUTIONS

Andressa Pestana Brito and **Virgínia Nunes Lima** participated in the study conception and design and in the writing and/or revision of the manuscript. **Eliziane Gomes da Costa Moura da Silva** participated in the acquisition, analysis and interpretation of data. **Adriana Sousa Rêgo**, **Luciana Pereira Pinto Dias** and **Wyllyane Rayana Chaves Carvalho** participated in the writing and/or revision of the manuscript. **Josélia Dias Silva** participated in the study conception and design. **Janaina Maiana Abreu Barbosa** participated in the acquisition, analysis and interpretation of data and in the writing and/or revision of the manuscript.

REFERENCES

1. Brasil. Presidência da República. Lei nº 11.346, de 15 de setembro de 2006. Cria o Sistema Nacional de Segurança Alimentar e Nutricional – SISAN com vistas em assegurar o direito humano à alimentação adequada e dá outras providências. Diário Oficial da União; 18 set. 2006.

2. Gregório MJ, Graça P, Nogueira PJ, Gomes S, Santos CA, Boavida J. Proposta Metodológica para a Avaliação da Insegurança Alimentar em Portugal. Rev Nutrícias. 2014;21:4-11.

3. Ministério do Planejamento, Orçamento e Gestão (BR); Instituto Brasileiro de Geografia e Estatística. Censo demográfico 2013. Rio de Janeiro: IBGE; 2013.

4. Ministério do Desenvolvimento Social e Combate à Fome (BR); Ministério do Planejamento, Orçamento e Gestão; Instituto Brasileiro de Geografia e Estatística. Pesquisa Nacional por Amostra de Domicílio: segurança alimentar 2013. Rio de Janeiro: IBGE; 2004.

5. Ministério do Planejamento, Orçamento e Gestão (BR); Instituto Brasileiro de Geografia e Estatística. Censo demográfico 2010. Rio de Janeiro: IBGE; 2010.

6. Pereira MHQ, Pereira MLAS, Martins BEP, Santos SMC. Segurança Alimentar e Nutricional e fatores associados em municípios baianos de diferentes portes populacionais. Rev Segur Aliment Nutr. 2019;26:1-11.

7. Morais DC, Lopes SO, Priore SE. Indicadores de avaliação da Insegurança Alimentar e Nutricional e fatores associados: revisão sistemática. Cienc Saude Colet [Internet]. 2019 [accessed on 2019 Nov 19]. Available from:: http://www.cienciaesaudecoletiva.com.br/artigos/indicadores-de-avaliacao-da-inseguranca-alimentar-e-nutricional-e-fatores-associados-revisao-sistematica/17083

8. Costa NS. Prevalência e fatores associados a insegurança alimentar e nutricional [dissertation]. Maceió: Universidade Federal de Alagoas; 2016.

9. Ribeiro JCS, Santos SMC, Soares TMB, Accioly JABC. Segurança Alimentar e Nutricional: avaliação e fatores determinantes em consórcio de municípios, Bahia, Brasil. Demetra. 2018;13(1):83-100.

10. Panigassi G, Segall-Corrêa AM, Marin-León L, Pérez-Escamilla R, Sampaio MFA, Maranha LK. Insegurança alimentar como indicador de iniqüidade: análise de inquérito populacional. Cad Saúde Pública. 2008;24(10):2376-84.

11. Brasil. Lei nº 11.346, de 15 de setembro de 2006. Lei Orgânica de Segurança Alimentar e Nutricional. Institui o Sistema Nacional de Segurança Alimentar e Nutricional a fim de assegurar direito humano à alimentação adequada para toda população brasileira. Brasília, DF: Diário Oficial da União; 18 set 2006.

12. Conselho Nacional de Segurança Alimentar e Nutricional. Princípios e diretrizes para uma política nacional de segurança alimentar. Brasília: CONSEA; 2004.

13. Ministério da Saúde (BR), Secretaria de Vigilância em Saúde, Secretaria de Atenção à Saúde. Política Nacional de Promoção da Saúde: PNPS: Anexo I da Portaria de Consolidação nº 2, de 28 de setembro de 2017, que consolida as normas sobre as políticas nacionais de saúde do SUS/ Ministério da Saúde, Secretaria de Vigilância em Saúde, Secretaria de Atenção à Saúde. Brasília: Ministério da Saúde; 2018.

14. Soares MESM. Qualidade de vida e segurança alimentar: estudo de base populacional no município de João Pessoa-PB [thesis]. João Pessoa: Universidade Federal da Paraíba; 2016.

15. Gubert MB, Perez-Escamilla R. Insegurança alimentar grave municipal no Brasil em 2013. Ciênc Saúde Colet. 2018;23(10):3433-44.

16. Segall-Corrêa AM, Pérez-Escamilla R, Sampaio MFA, Marín-León L, Panigassi G, Maranha LK, et al. Acompanhamento e avaliação da segurança alimentar de famílias brasileiras: validação de metodologia e de instrumento de coleta de informação Urbano/Rural. Campinas: UNICAMP; 2004.

17. Almeida JA, Santos AS, Nascimento MAO, Oliveira JVC, Silva DG, Mendes-Netto RS. Fatores associados ao risco de insegurança alimentar e nutricional em famílias de assentamentos rurais. Ciênc Saúde Colet. 2017;22(2):479-88.

18. Sabóia RCB, Santos MM. Prevalência de insegurança alimentar e fatores associados em domicílios cobertos pela Estratégia Saúde da Família em Teresina, Piauí, 2012-2013. Epidemiol Serv Saúde. 2015;24(4):749-58.

19. Pedraza DF, Bezerra TA, Ana C, Cerqueira DR, Fonsêca JS. (In)-Segurança alimentar de famílias residentes em um município do interior da Paraíba, Brasil. Rev Saude Publica. 2017;19(5):649-56.

20. Lopes AF, Frota MTBA, Leone C, Szarfarc SC. Perfil nutricional de crianças no estado do maranhão. Rev Bras Epidemiol. 2019(22):e190008.

21. Morais DC, Sperandio N, Dutra LV, Franceschini SCC, Santos RHS, Priore SE. Indicadores socioeconômicos, nutricionais e de percepção de insegurança alimentar e nutricional em famílias rurais. Segur Aliment Nutr. 2018;25(2):1-11.

22. Câmara Interministerial de Segurança Alimentar e Nutricional (BR). II Plano Nacional de Segurança Alimentar e Nutricional - PLANSAN 2016-2019. Brasília: CAISAN; 2018.

23. Bezerra TA, Olinda, RA, Pedraza, DF. Insegurança alimentar no Brasil segundo diferentes cenários sociodemográficos. Ciênc Saúde Colet. 2017;22(2):637-51.

24. Santos KKD, Mandacaru SMP, Matta RA, Murta NMG, Freitas RF, Lessa AC. Fatores associados à insegurança alimentar em populações pobres do município de Diamantina-MG. Revista Espacios. 2017;38(12)19.

25. Rocha NP, Szarfarc SC, Lira PIC, Sequeira LAS, Silveira VNC, Frota MTBA. Condição de (In)Segurança Alimentar e fatores associados de famílias com crianças menores de cinco anos de idade do Estado do Maranhão. Segur Aliment Nutr. 2018;25(3):71-80.

26. Amaral VR, Basso D. Segurança Alimentar e Nutricional no Brasil: uma análise em perspectiva histórica. Rev Desenvolv Reg. 2016;13(1):181-200.

27. Souza BFNJ, Marin-Leon L, Camargo DFM, Segall-Corrêa AM. Demographic and socioeconomic conditions associated with food insecurity in households in Campinas, SP, Brazil. Rev Nutr. 2016;29(6):845-57.

28. Omuemu VO, Otasowie EM, Onyiriuka U. Prevalence of food insecurity in Egor local government area of Edo State, Nigeria. Ann Afri Med. 2012;11(3):139-45.

29. Organização das Nações Unidas. Transformando nosso mundo: Agenda 2030 para o desenvolvimento Sustentável. 2015 [accessed on 2016 Mar 29]. Available from:: https://nacoesunidas.org/pos2015/agenda2030/

30. Cardoso F, Avelar KES. Aproveitamento integral dos alimentos e o seu impacto na saúde. Sustentabilidade Destaque. 2015;6(3):131-43.

31. Cavenhagi S, Alves JED. Mulheres chefes de família no Brasil: avanços e desafios. Rio de Janeiro: ENS-CPES; 2018.

32. Rodrigues AM, Santos EC, Faria TP, Faria AL, Chamon EMQO. Segurança alimentar de famílias com pré-escolares da zona rural de um município do Vale do Paraíba paulista. DEMETRA. 2020;15:1-12.

33. Instituto Brasileiro de Análises Sociais e Econômicas. Repercussões do Programa Bolsa Família na segurança alimentar e nutricional: relatório síntese. Rio de Janeiro: IBASE; 2008.

34. Costa LNF, Braga MM, Rocha M, Lima MS, Campêlo WF, Vasconcelos CMCS. Fatores associados à insegurança alimentar em pessoas que vivem com HIV/AIDS. Rev Bras Promoç Saúde. 2018;31(1):1-8.

35. Hoffmann R. Determinantes da Insegurança Alimentar no Brasil: Análise dos Dados da PNAD de 2004. Segur Aliment Nutr. 2008;15(1):49-61.

36. Maas NM, Sassi M, Andres R, Meucci, Rodrigo Dalke, Cesar J. Insegurança Alimentar em famílias de área rural do extremo sul do Brasil. Cienc Saude Colet [Internet]. 2018 [accessed on 2019 Nov 19]. Available from: http://www.cienciaesaudecoletiva.com.br/artigos/inseguranca-alimentar-em-familias-de-area-rural-do-extremo-sul-do-brasil/17030?id=17030

37. Ministério do Planejamento, Orçamento e Gestão (BR); Instituto Brasileiro de Geografia e Estatística. Censo demográfico 2012. Rio de Janeiro: IBGE; 2012.

38. Silva KSM, Fontoura ES, Blümke AC, Margutti KMM. Insegurança alimentar e sua relação com fatores socioeconômicos de nutrizes atendidas na atenção primária. Rev Eletrônica Disciplinarum Scientia. 2015;16(2):221-9.

39. Sperandio N, Priore SE. Prevalência de insegurança alimentar domiciliar e fatores associados em famílias com pré-escolares, beneficiárias do Programa Bolsa Família de Viçosa, Minas Gerais, Brasil. Epidemiol Serv Saúde. 2015;24(4):739-48.

40. Oliveira DS, Demétrio F, Soares MD, Henrique FCS, Santos LA. Prevalência e fatores associados à insegurança alimentar. Rev Baiana Saúde Pública. 2017;41(3):561-79.

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