HUMAN AND SOCIAL SCIENCES IN FOOD

DOI: 10.12957/demetra.2020.43636

DEMETRA Alimentação, Nutrição & Saúde

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Article with data from the research: "Nutrition Conditions and Food Security for Women and Children from Quilombola Communities in Maranhão". Maria Tereza Borges Araújo Frota, Federal University of Maranhão, 2015.

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Food insecurity and nutrition situation in quilombola families in Maranhão state, Brazil

Situação de insegurança alimentar e nutricional em famílias quilombolas maranhenses

Abstract

Introduction: Food and Nutritional Security is related to housing conditions, basic sanitation, quality water, access to social programs, education, employment, and access to food consumption. ***Objective:*** To evaluate the prevalence and factors associated with food and nutritional insecurity in families from quilombola communities in Maranhão. ***Methods:*** Socioeconomic, demographic and health data were collected from 373 quilombola families, in the municipalities of Penalva and Viana - MA, in 2015, using a form applied at home. Food and nutritional insecurity was assessed using the Brazilian Food Insecurity Measurement Scale. The factors associated with food insecurity were obtained through factor analysis of latent class (p<0,05). ***Results:*** The prevalence of food and nutritional security was 20,1%, while that of food and nutritional insecurity was 79,9%, of which 32,2% were classified as mild, 25,7% moderate and 22,0% serious. Families headed by women, households with more than five people, family income per capita lower than a quarter of the minimum wage and the non-coverage by the family health strategy were the variables associated with the classes of mild and moderate insecurity (p<0,05). While in severe, all variables in the model were associated (p<0,05). ***Conclusion:*** Food and nutritional insecurity is high in the quilombola communities studied, especially the severe one. These results point to the need for public policies aimed at ensuring access to education, increasing the supply of work, guaranteeing minimum income and expanding coverage of the family health strategy in quilombola communities.

Keywords: Food and Nutritional Security. Vulnerable Populations. African Continental Ancestry Group. Family.

Resumo

Introdução: A segurança alimentar e nutricional está relacionada às condições de moradia, saneamento básico, água de qualidade, acesso a programas sociais, escolaridade, emprego e acesso ao consumo de alimentos. ***Objetivo:*** Avaliar a prevalência e os fatores associados à insegurança alimentar e nutricional em famílias de comunidades quilombolas maranhenses. ***Métodos:*** Foram coletados dados socioeconômicos, demográficos e de saúde de 373 famílias quilombolas, nos municípios de Penalva e Viana - MA, em 2015, por meio de formulário aplicado nos domicílios. A insegurança alimentar e nutricional foi avaliada utilizando-se a Escala Brasileira de Insegurança Alimentar. Os fatores associados à insegurança alimentar foram obtidos por meio da análise fatorial de classe latente (p<0,05). ***Resultados:*** A prevalência de segurança alimentar e nutricional foi de 20,1%, enquanto a de insegurança alimentar e nutricional foi de 79,9%, das quais 32,2% foram classificadas como leve, 25,7% moderada e 22,0% grave. Famílias chefiadas por mulheres, domicílios com mais de cinco pessoas, renda familiar per capita inferior a um quarto

de salário mínimo e a não cobertura pela Estratégia Saúde da Família foram as variáveis associadas às classes de insegurança leve e moderada (p<0,05); na grave, todas as variáveis do modelo foram associadas (p<0,05). ***Conclusão:*** A insegurança alimentar e nutricional é elevada nas comunidades quilombolas estudadas, especialmente a grave. Esses resultados apontam para a necessidade de políticas públicas voltadas para assegurar acesso à educação, aumento da oferta de trabalho, garantia da renda mínima e expansão da cobertura da Estratégia Saúde da Família nas comunidades quilombolas.

Palavras-chave: Segurança Alimentar e Nutricional. Populações Vulneráveis. Grupo com Ancestrais do Continente Africano. Família.

INTRODUCTION

Food and nutrition security (FNS) means guaranteeing all people conditions of permanent access to sufficient quality food, without compromising access to other essential needs, based on healthy eating practices, contributing to a dignified life, in a context of integral development of the human being. [1]

This concept is complemented by the approach to the legal aspects and human rights principles, broadening its scope and making vulnerable groups remain in the spotlight, moving from beneficiaries to holders of rights.[2] In Brazil, food has been incorporated into citizens' social rights by means of Constitutional Amendment No. 64 of 2010, which amended art. 6 of 1988 Federal Constitution. [3]

According to the United Nations Organization for Agriculture and (FAO), the last three years have been marked by an increasing worldwide increase in the number of people suffering from hunger, similar to the levels found in the 2001 decade. In 2016, the number of people affected by malnutrition or chronic food shortages in the world was 804 million, a number that increased to almost 821 million in 2017 - about one in every nine people.[4] These data represent a risk to the achievement of the target of Sustainable Development Goals (SDGs) to eradicate hunger by 2030.[5]

Brazil was highlighted in the FAO international report, State of Food Insecurity in the World 2014,[6] for being an example of governance and Successful FNS, which removed the country from the World Hunger Map. In this way, Brazil has improved in terms of reducing hunger, child malnutrition and malnutrition, fulfilling and even surpassing the Millennium Development Goals. Brazil's performance was monitored by FAO, that highlighted the country's evolution in fighting hunger among 2003 and 2013.[7] However, between 2014 and 2016, the Brazilian population in extreme poverty went from 5.1 million to 10 million people and the number of people in poverty increased from 14 million to 21 million.[8] This points to a possible return of Brazil to the World Hunger Map, because its economic development has not kept pace with the demographic growth.[9,10] Traditional communities, such as quilombola, are historically disadvantaged and suffer a process of invisibility and inequality since their basic rights were long denied.[11] Equality policies adopted since 2003 represented a major step forward in tackling inequities in these communities.[12-14] However, despite advances conquered, in 2016 Brazil was still one of the most unequal countries in the world,[15] and differences related to color or race result in significant consequences for the parents.[16,17] Traditionally, the situation of food and nutritional insecurity (FNI) has been associated with several factors, among which stand out skin color, substandard housing, low coverage of running water supply and sewage disposal, access to social programs, educational attainment, employment and income, and access to food consumption.

In Maranhão, studies focusing on this ethnic group are still scarce, so little is known about the reality in which these families live, showing the situation of social invisibility in which they find themselves. Thus, the objective of this study is to evaluate the prevalence and factors associated with insecurity food and nutrition in quilombola communities in Maranhão.

METHODS

This is a cross-sectional study from the research "Nutrition Conditions and Food Security for Women and Children from Quilombola Communities in Maranhão", developed with the objective of assessing health and nutrition conditions of children under five in quilombola communities in the state of Maranhão, Brazil and which also assessed socioeconomic and demographic aspects, situation of food insecurity of families and the state of anemia of women and children.

Data collection took place in 2015, in remaining communities of quilombos in the municipalities of Penalva and Viana, with or without collective title land issued by official bodies. These communities are in the *Baixada Maranhense*, approximately 40 km away. Penalva has 45 communities and 1,383 families, while Viana has 29 communities and 100 families. Twenty-seven of the 74 quilombola communities located in those areas were visited.[18]

The municipalities were selected by convenience, as they are communities whose local leaders were receptive to the study. The sample was a probabilistic type, calculated using the STATA® version 14.0, with a 95% confidence level, a standard error of 5% and an expected prevalence of 70.9% food insecurity, [19] resulting in a sample of 315 quilombola families, to which 10% were added to avoid possible losses, making up an estimated sample of 346 families. Data were collected from 373 quilombola families (7.8% more response rate).

According to the lists of local community health workers, all families that met the inclusion criteria of the study were visited, which are: having children under the age of five in their composition, residing in remaining quilombo community, have a family member eligible for respond the questionnaire and agree to participate in the research. The non-inclusion criteria were twin children and those with sickle cell anemia reported by the mother.

The interviews were carried out by previously trained researchers, qualified and supervised to apply the adapted, validated and pre-codded form based on the 2010 State Health and Nutrition Survey, [20] in the households of the assessed families, being applied to women, who are traditionally responsible for food issues at home.

The form investigated sociodemographic data, housing conditions and access to health services, which are classically associated to the situation of FNI, such as sex of the head of the family (male and female), educational attainment of the head of the family and of the mother (≤ 4 years of study and > 4 years of study), job of the head of the family (yes and no), total number of people in the household (≤ 5 and > 5), family income per capita (<¼ minimum wage and ≥ ¼ minimum wage), coverage by the Family Health Strategy program (yes and no), visit by the community health agent (yes and no), number of daily meals (< 3 and ≥ 3), sewage disposal (existing and not existing) drinking water treatment (treated and untreated), source of drinking water (public supply and well / cacimba / barreiro / cistern) and participation in *Bolsa Família* Program (yes and no).

The outcome of this study was the situation of FNI, which was assessed using the Brazilian Food Insecurity Measurement Scale (EBIA). It is a psychometric scale, which addresses concepts divided into 15 closed questions, that allows estimating, evaluating, and classifying the family's perception of food in the last three months. The situation of FNI of families was classified into: FNS and mild, moderate, and severe FNI.[21]

Descriptive analysis and latent classes analysis were performed, which allows investigate whether the covariance relationship between a group of observable variables is explained by another latent variable, insecurity being this latent phenomenon measured by the 15 questions/answers directly observed on the used scale, checking the associations for each FNI classification (mild, moderate and severe). The power of the study was calculated using the OpenEpi program.[22] Considering a 95% confidence interval and the exposure difference between those exposed to food and nutritional insecurity and not exposed, a 100% power was obtained.

Data entry was performed with double entry, in the Epi-info ® program, version 3.5.2, to identify inconsistencies in typing. To the description of the numerical variables and analysis of the factors associated with FNI, it was used the software Stata® (version 14.0).

The project was approved by the Research Ethics Committee of the Universidade Federal do Maranhão, under opinion number 1.627.919, in accordance with the requirements of the National Health Council Resolution (CNS nº. 466/2012) and its complementary

RESULTS

The prevalence of food and nutritional insecurity in the 373 families assessed was 79.9% (95% CI: 75.8 - 84.0%). Among these, 32.2% (95% CI = 27.6 - 37.1) had mild; 25.7% (95% CI = 21.6 - 30.4) had moderate; and 22.0% (95% CI = 18.1 - 26.4) had severe food insecurity.

With regard to the sociodemographic description, housing conditions and access to health services (table 1), stand out the low frequency of families who had a running water from public supply (4.8%), the non-coverage of the Family Health Strategy (83.9%) and the high frequency of family income per capita lower than a quarter of the minimum wage (79.9%).

Table 1. Socioeconomic characterization, housing conditions, access to health services and food and nutritional insecurity of quilombola families. Maranhão, 2015.

Variables	n (%)
Sex of the head of the family	
Male	181 (48.5)
Female	192 (51.5)
Schoolinf of the read of the family	
≤ 4 years of study	130 (34.8)
> 4 years of study	243 (65.2)
Sewage disposal	
Existing	42 (11.3)
Not existing	331 (88.7)
Drinking water treatment	
Treaded	178 (47.7)
Untreated	195 (52.3)
Total number of people in the household	
≤ 5	243 (65.15)
≥ 5	130 (34.85)
Visit by the Community Health Agent	
Yes	335 (89.8)
No	38 (10.2)
Family Health Strategy coverage	
Yes	60 (16.1)
No	313 (83.9)
Family income per capita	
< ¼ minimum wage	298 (79.9)
≥ ¼ minimum wage	75 (20.1)
Number of daily meals	
< 3	52 (13.9)
≥ 3	321 (86.1)
Participation in Bolsa Família program	
Yes	308 (82.6)
No	65 (17.4)
Food and Nutritional Insecurity	
Food and Nutritional Security	75 (20.11)
Mild Food and Nutritional Insecurity	120 (32.17)
Moderate Food and Nutritional Insecurity	96 (25.74)
Severe Food and Nutritional Insecurity	82 (21.98)

Latent classes analysis was performed to identify the factors with probability of occurrence in the insecurity classes. In mild insecurity, it was observed that families headed by women, residing in households with more of five people, with per capita family income less than a quarter of the minimum wage and without coverage by the Family Health Strategy were likely to 49.9% (95% CI = 31.6 - 68.1), 48.0% (95% CI = 25.1 - 70.9), 76.9% (95% CI = 58.2 -95.7) and 83.9% (95% CI = 64.5 - 103.2) of occurrence in this group, respectively (Table 2).

In moderate food insecurity, it was observed that the same variables of the previous group (female-headed households, households with more than five, family income per capita less than a quarter of the minimum wage and not coverage by the Family Health Strategy) showed associations with respective probabilities of occurrence of 49.9% (95% CI = 35.1 - 64.7), 48.0%(95% CI = 30.1 - 66.0), 76.9% (95% CI = 61.2 - 92.6) and 83.9% (95% CI = 67.7 - 100.1).(Table 2).

In the case of severe food insecurity, all variables included in the model showed a statistically significant association, being: sex of the head of the family, with a probability of 54.6% (95% CI = 39.7 - 69.5); schooling of the head of family, with 49.3% (95% CI = 31.2 - 67.5); maternal schooling, with 32.0% (95% CI= 12.8 - 51.2); total members in the household, with 66.6% (95% CI = 50.2 - 83.1); family income per capita, 85.6% (95% CI = 68.4 - 102.7); family coverage by the Family Health Strategy, with 84.0% (95% CI = 67.4 - 100.5); family visited by the community health agent, with 13.0% (95% CI = 4.5 - 21.4); and daily number of meals, with 17.2% (95% CI = 7.6 - 26.8), as shown in Table 2.

Table 2. Latent classes analysis of variables associated with food and nutritional insecurity according to degrees of severity, in quilombola families. Maranhão, 2015.

Variables	Mild Insecurity		Moderate Insecurity		Severe Insecurity	
	Probability	CI95%	Probability	CI95%	Probability	CI95%
Woman is head of the household	49.9%*	31.6-68.1	49.9%*	35.1-64.7	54.6%*	39.7-69.5
Head of the household studied < 4 years	8.5%	-11.6-28.6	8.5%	-7.0-24.0	49.3%*	31.2-67.5
Mother studied < 4 years	4.9%	-94.1-85.6	0.0%	-1.5-1.5	32.0%*	12.8-51.2
More than five people at home	48.0%*	25.1-70.9	48.0%*	30.1-66.0	66.7%*	50.2-83.1
Family income per capita < ¼ of minimum wage	76.9%*	58.1-95.7	76.9%*	61.2-92.6	85.6%*	68.4-102.7
Family not covered by Family Health Strategy	83.9%*	64.5-103.2	83.9%*	67.7-100.1	84.0%*	67.4-100.5
Family not visited by Community Health Agent	8.7%	-10.4-27.8	8.7%	-5.5-23.0	13.0%*	4.5-21.4
Less than 3 meals daily	12.2%	-4.0-28.5	12.2%	-1.9-24.7	17.2%*	7.6-26.8

* $p < 0,05$

DISCUSSION

In this study it was possible to analyze the FNI situation of families of quilombola communities in Maranhão. There was a high prevalence of FNI, and the factors associated with degrees of mild and moderate severity were: families headed by women; households with more than five members; family income per capita lower than a quarter of the minimum wage; not coverage by the Family Health Strategy. It is noteworthy that the category of severe insecurity was associated, in addition to these, to the other studied variables.

The rates of FNI presented by Maranhão have always been higher when compared to the national and even regional situation. In 2009, the state had prevalence of 31.2%[23] of moderate and severe FNI. Although in 2013 this value decreased to 23.7%, remains the highest of all federated units.[24]

Different scales were applied to assess the FNS situation by the studies used to formulate the discussion in this work. FAO developed the Food Insecurity Experience Scale (FIES),[25] in order to allow comparison of the severity of food insecurity experienced by families or individuals among countries, based on US scales, the Household Food Insecurity Access Scale (HFIAS)[26] and Latin America, the Escala Latinoamericana y Caribeña de Seguridad Alimentaria (ELCSA).[27]

EBIA also measures the situation of food insecurity experienced by families, in order to identify different degrees of access to food, from the complete satisfaction of food needs to the most serious condition of food restriction.[21] In other words, despite being different scales, all were adapted to, according to the individual's perception, capture the family FNI.

The prevalence of FNI found in quilombola families in Maranhão was lower than that observed in a study in the provinces of Gauteng and Limpopo, South Africa.[28] However, higher prevalence rates have been reported by studies in other African countries, with the same ancestry,[29-31] in developing countries, in the case of Mexico[32] and India,[33] as well as the indices presented by developed countries, from Europe,[34] United States[35,36] and Australia.[37]

The FNI in this study also had a higher prevalence when compared to results observed in other studies with a focus on quilombola communities in Brazil.[38-40] In these studies, FNI was associated with lowest economic level, be a beneficiary of the *Bolsa Família* Program, live in rural areas, no running water, lower educational attainment by the head of the family and more than four residents per household.[38-40]

Although the National Household Sample Survey (PNAD)[41] points to an improvement in the country, regarding the educational situation and employment uneven growth is evident, even with actions and strategies that sought to promote the homogeneous development of public, social and economic measures designed to face the situation of food insecurity and nutritional.[42-44]

In socially vulnerable populations, such as quilombola, the food and nutritional insecurity is predominantly greater than in the general population (64.9% vs. 42.0%), being significantly associated with the family residing in quilombola community, to have lower economic level (with dose-response relation) and be a beneficiary of an income transfer program.[40] In fact, in this study, for 30.2% of *Bolsa Família* Program holders, the amount received corresponded to 75.0% to 100.0% of the total family income, and for 18.2% of families the program was the only source of income.

Brazil left the Hunger Map in 2014[45] and improved FNS indexes, because of policies aimed at ensuring a safe and healthy food for all[46,47] Nevertheless, traditional communities, such as quilombos, continue to have the worst FNS rates. This highlights the extreme inequality of a social, structural, racial, and economic nature in the country.[48,49]

It is also important to highlight the association between female-headed families and food and nutritional insecurity, as seen in other surveys conducted in Brazil.[50,54] A possible explanation for this association could be because women still earn less than men, becoming an aggravating factor due to skin color and race, which already has a disadvantage in itself.[15,55] In addition, the maternal schooling was also associated with severe FNI, as greater schooling provides better quality of life, greater knowledge about the food consumption of quality and mainly greater chances of insertion in the job market.[53,56]

Another factor that showed a positive association with the situation of food and nutritional insecurity was the lack of coverage of the Family Health Strategy and the insufficient visits by the community health agent to monitor families. This compromise the reach of these families to health promotion activities and disease prevention.[57,58] It should be noted that the monitoring of families is a commitment of the Unified Health System (SUS) for the fulfillment of the health conditionalities of the *Bolsa Família* Program and for the reduction of social inequalities in the country.[59] However, geographic accessibility of public health services to these communities is still a barrier nowadays.[60,61]

The households where five or more people lived had higher prevalence of FNI, as in similar studies carried out in the states of Minas Gerais and Paraíba.[62,64] Larger families are considered to need buy more food and are more likely to have per capita income minor, especially in families where the provider is a single person. Once that financial growth does not accompany family growth, this can influence the number of meals per day described by quilombola families.[38,65,66]

Per capita income was significant at all stages of the analysis, corroborating studies in which one of the main factors associated with the situation of household food insecurity is low income,[67,71] followed by low schooling, cohabitation of more than five members at home and the head of the family be woman. Thus, income alone does not explain the occurrence of FNI, being this also presented by environmental, economic, and demographic conditions that, together with income, interfere in the food security standard.[72,74]

The association between family income per capita and the Families' FNI shows that income is the main factor that drives to a regular and permanent access to food.[38,65] However, other aspects can influence the availability of food in the region, such as access to land and water to provide food products for family consumption.

The impact of socioeconomic improvement on the FNS situation was assessed at a cohort study carried out in 2005 and 2011, in municipalities in the interior of Paraíba, with families assisted by the *Bolsa Família* Program. This study pointed out that the increase in per capita income from R$ 130.70 to R$ 302.50, and the improvement in socioeconomic indicators, per capita income and participation in the *Bolsa Família* Program, implied an increase in food security and the mild FNI of the interviewed families, with a reduction of 20% of families that were classified as poor.[75]

The socioeconomic difference highlights the social inequality between blacks and whites, given that a study conducted in Brazil by the Economic Research Institute (IPEA) in 2010 showed that the average per capita household income of the white population (R$ 1,097.00) was more than twice the black population (R$ 508.90).[15]

Maranhão has one of the lowest values in the Human Development Index - Income (HDI) of the country (0.623), equivalent to a per capita household income average of R$ 387.34, lower than all Brazilian states.[76] This is an unfavorable environment to individual development, because the region in which remaining quilombola live are linked, in this context, to a poor living conditions and socio-economic deprivation that will hardly meet their basic needs.

In this regard, the importance of environmental sustainability is highlighted for these communities, since the remaining quilombos depend on the land subsistence, mainly through agriculture and fishery. Note that there is a need to expand actions that stimulate production, favoring ethnodevelopment and quilombola autonomy.[16] Thus, local knowledge is aligned with activities sustainable and healthy, which contribute to the community's access to food and economic development through family farming.

It is important to note that the adoption of sustainable food systems and healthy food promoters is among the six universal commitments undertaken by Brazil for the United Nations Decade of Action for Nutrition(2016-2025);[77] therefore, they should be stimulated at the national level.

The present work has limitations in relation to its cross-sectional type and the fact that data collection was carried out in two municipalities selected for convenience, not allowing establishing a cause and effect relationship, nor infer the results for other quilombola communities.

However, the pioneering spirit of its investigation and the performance of a robust analysis for the determination of the factors associated with FNI, contributing to fill gaps regarding the FNI situation of the quilombos in Maranhão.

CONCLUSION

In conclusion, 79.9% of the quilombola families from Maranhão analyzed presented some level of food and nutritional insecurity. The main factors associated with food and nutritional insecurity were families headed by women, households with more than five members, family income per capita lower than a quarter of minimum wage and not coverage by the Family Health Strategy.

These results demonstrate the importance of demographic aspects, economic and health benefits for access to food in quantity and quality sufficient and point to the need to implement public intersectoral policies aimed at guaranteeing FNS and the human right to food proper.

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Contributors

Silva BMA and Silveira VNC participated in the analysis and interpretation of the data; Padilha LL participated in the interpretation and final revision of the article; Frota MTBA participated in the review and approval of the final version of the article.

Conflict of Interest: The authors declare that there is no conflict of interest.

Received: January 14, 2020
Accepted: May 6, 2020