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Food insecurity and health status among pregnant women in the semiarid region of Northeast Brazil

Insegurança alimentar e situação de saúde de gestantes do semiárido nordestino

Abstract

Introduction: Brazil faces the weakening of public health policies, especially those directed at access to food, which affects the quality of life of the population. ***Objective***: The aim of the present study was to investigate the health status of pregnant women in primary care in a municipality in the state of Rio Grande do Norte, Brazil. ***Methods***: A cross-sectional study was conducted involving an analysis of access to foods using the Brazilian Food Insecurity Scale, anthropometric measures and a questionnaire designed to collect information on the perception of health among pregnant women. The chi-square test was used to investigate associations between categorical variables, with a p-value < 0.05 considered indicative of statistical significance. ***Results***: The prevalence of food insecurity was high among the pregnant women (70.6). Food insecurity was associated with chronic noncommunicable diseases (p=0.036) and being a beneficiary of social assistance programs (p=0.028). Despite advances in society, social determinants remain strongly associated with food and nutritional insecurity in the population, especially individuals with a low income and beneficiaries of social assistance programs. ***Conclusion***: The present findings underscore the need for the implantation and expansion of public policies that ensure the human right to adequate, healthy food among pregnant women, which has been severely violated, considering the importance to the health of the mother-child dyad.

Keywords: Food Insecurity. Primary Health Care. Pregnant Women. Public Health Policies.

Resumo

Introdução: O Brasil enfrenta um cenário de enfraquecimento das políticas públicas em saúde, principalmente as voltadas ao acesso à alimentação, afetando a qualidade de vida da população. ***Objetivo***: Buscou-se investigar a situação de saúde e de segurança alimentar e nutricional de gestantes usuárias da Atenção Primária à Saúde de um município do interior do Rio Grande do Norte. ***Métodos***: Trata-se de um estudo transversal que analisou as condições de acesso aos alimentos por meio da Escala Brasileira de Insegurança Alimentar, além de realizar avaliação antropométrica e de percepção de saúde de gestantes, através de questionário estruturado adaptado para tal fim. Realizou-se o teste de Qui-quadrado de Pearson para verificar a associação entre as variáveis categóricas do estudo, considerando-se estatisticamente significante as associações com valores de p < 0,05. ***Resultados***: Identificou-se alta prevalência de insegurança alimentar (IA) entre a s gestantes (70,6%) e associação entre insegurança alimentar (IA) e doenças crônicas não transmissíveis (p=0,036) e programas sociais assistenciais (p=0,028). Apesar dos avanços enquanto sociedade, ainda há determinantes sociais fortemente relacionados à insegurança alimentar e nutricional da população, principalmente quanto à menor renda e na população beneficiária de programas socioassistenciais. ***Conclusão***: Este estudo

ressalta a necessidade de implantação e ampliação de políticas públicas que garantam o Direito Humano à Alimentação Adequada e Saudável de gestantes – que se encontra gravemente violado –, haja vista sua importância para a saúde do binômio.

Palavras-chave: Insegurança Alimentar. Atenção Primária à Saúde. Gestantes. Políticas Públicas de Saúde.

INTRODUCTION

Brazil has experienced diverse circumstances that led to transformations in social aspects and food consumption by the population. The National Food and Nutrition Policy was instituted in 1999, which was a set of public policies to ensure human rights with regards to health and nutrition. This policy strengthens the concept of food and nutritional security as regular, permanent access to foods of sufficient quality and quantity without compromising access to other essential needs.[1]

In 2017-2018, however (pre-COVID-19 pandemic), severe food insecurity (FI) affected approximately 10.3 million Brazilian homes.[2]With the emergence of the COVID-19 pandemic in 2020 and amidst a health crisis, the situation of FI was aggravated in the country, leading to the weakening of social policies. A significant increase in FI estimates occurred within a short period. By the end of the year 2021, 116.8 million Brazilians were in a situation of FIand 19 million were in a situation of hunger. With a new survey conducted in 2022, an estimated 125.2 million Brazilians are in a situation of FI and more than 33 million live with hunger (severe FI). The survey also discussed social determinants associated with FI and highlighted gender inequality as exerting an influence of food security and insecurity in Brazilian homes, as more than six out of every 10 homes with a female head of household had some degree of FI.[3,4]

Historically, women have been more vulnerable to food and nutrition insecurity than men, demonstrating that gender justice is a relevant factor for the promotion of food and nutritional security. The female population is restricted by patriarchal and capitalist systems that diminish women's power and access to foods as well as other goods and services. However, women occupy significant positions in the production and distribution of foods, although often underpaid or not paid at all.[5]

In the Brazilian public healthcare system, the structuring and implantation of public polices directed at women's health occurred to adhere to the doctrinal policies that govern the system. The National Integral Women's Healthcare Policy emerged with the aim of improving the living and health status of Brazilian women as well as to ensure and expand access to healthcare services.[6]

In primary care, qualified care for women is mainly provided when they are pregnant due to the fact that this cycle of life requires integral follow-up. However, FI has become a worrisome factor for this population, as this situation compromises nutritional status, with a greater frequency of anemia, hyperglycemia and other health conditions that place the mother-child dyad at risk.[7]

Therefore, the aim of the present study was to investigate the food security situation and health status of pregnant women in primary care in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil.

METHODS

Population and sample

A quantitative analytical study was conducted with pregnant women in the municipality of Santa Cruz, which is located in the state of Rio Grande do Norte, Brazil. The non-probabilistic convenience sample was composed of individuals who met the following inclusion criterion: pregnant women in any trimester undergoing prenatal care at primary care units in the municipality. Women who did not sign the statement of informed consent were not included. Data collection took place from April to

August 2022, with the administration of a questionnaire adapted from Silva & Costa[8]to the women after routine prenatal care at the primary care units.

Variables of interest

- **Demographic, socioeconomic, health-related and lifestyle characteristics**

The data collection instrument addressed sociodemographic characteristics of the women, such as marital status, self-declared race/skin color, level of schooling, family income, occupation and number of residents in the home. The presence of chronic noncommunicable disease was also investigated, along with lifestyle habits associated or not with health risks that the respondent exercised at the time. Self-perceived health was investigated through a question on how the respondent would classify her health, with the following response options: excellent, good, fair or poor.

- **Assessment of food consumption**

The questionnaire included five simplified items based on the "Ten steps to adequate, healthy eating" to characterize the preference for whole foods, minimally processed foods (response options: 'yes' and 'no') and ultra-processed foods (response options for weekly frequencies: 'once per week', 'three times per week' and 'every day'). Information was also collected on the intake of fats, salt and sugar throughout the day (response options: 'yes', 'no' and 'use in greater quantity') as well as the planning of meals and variety of food choices at places of purchase (response options: 'yes' and 'no').

- **Anthropometric assessment**

Data were collected on pregestational weight, current weight and height to identify nutritional status based on the weight gain curves in the patient records, which consider pregestational nutritional status to establish the adequate weight gain range – 9.7 to 12.2 kg (for underweight individuals); 8 to 12 kg (for those in the ideal range); 7 to 9 kg (for overweight individuals); 5 to 7.2 kg (for obese individuals).[9] Pregestational weight and height were collected from the patient records, whereas current weight was measured at the time of the administration of the questionnaire. The participants adequately followed the protocol established by the primary care unit for pregnant women.[10]

- **Brazilian Food Insecurity Scale**

The complete 14-item version of the Brazilian Food Insecurity Scale was administered. The following categories were considered: Food security (score of 0 points); mild food insecurity (score 1-5 for homes with residents less than 18 years of age and 1-3for homes without residents less than 18 years of age); moderate food insecurity (score of 6-9 for homes with residents less than 18 years of age and 4-5 for homes without residents less than 18 years of age); and severe food insecurity (score of 10-14for homes with residents less than 18 years of age and 6-8 for homes without residents less than 18 years of age). For the purposes of statistical analysis, the categories were grouped as proposed by the VIGISAN method:[4] food security+mild Fland moderate + severe FI.

Data analysis

Data from the questionnaires were entered into the Excel program (2016 version) and statistical analysis was conducted with the aid of the SPSS program, version 20.0. Continuous variables: age was categorized as 13 to 19 years, 20 to 34 years and 35 years or older and pregnancy was classified in trimesters. Pearson's chi-square test was used for the determination of associations between variables, with a *p*-value < 0.05 considered indicative of statistical significance.

Ethical aspects

This study received approval from the Human Research Ethics Committee of the TrairiSchool of Health Sciences (FACISA/UFRN) (approval numbers: 5.264.613 and CAAE55491022.0.0000.5568).

RESULTS

Among the 98 participants in the study, 63.3% were young adults between 20 and 34 years of age and 46.9% were in the third trimester of pregnancy. The majority had had previous pregnancies (53.1%), had self-declared brown skin color(63.4%), had a complete primary school or high school education (62.2%), did not exercise an occupation (57.1%), reported being with a partner/spouse (67.3%) and resided in homes with less than four residents (69.4%) (Table 1). In terms of family income, 82.6% reported receiving up to the monthly minimum wage and 46.9% reported being beneficiaries of a governmental program (97.8% of whom were beneficiaries of the Brazil Aid Program) (Table 1)

Table 1. Socioeconomic and demographic characteristics of pregnant women in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil, 2022..

Variables	n°	%
Age		
13 to 19 years	20	20.4
20 to 34 years	63	64.3
35 years or older	15	13.3
Gestational period		
First trimester	24	24.5
Second trimester	28	28.6
Third trimester	46	46.9

Table 1. Caracterização das condições socioeconômicas e demográficas de gestantes do município de Santa Cruz-RN, 2022.

Variables	n°	%
First pregnancy		
Yes	46	46.9
No	52	53.1
Race/Skin color		
White	16	16.3
Black	20	20.4
Brown	62	63.4
Level of schooling		
Illiterate	5	5.1
Incomplete primary school	27	27.6
Complete primary or high school	61	62.2
Higher education	5	5.1
Occupation		
Employed	42	42.9
Not employed	56	57.1
Marital status		
With spouse	66	67.3
Without spouse	32	32.7
Residents in home		
1-3	68	69.4
≥4	30	30.6
Family income		
Up to monthly minimum wage*	81	82.6
More than monthly minimum wage	17	17.4
Beneficiary of some governmental program		
No	52	53.1
Yes	46	46.9
What governmental program		
Brazil Aid	45	97.8
Milk program	1	2.2

*monthly minimum wage: R$ 1212.

In terms of health status, 79.6% of the women reported not having chronic noncommunicable diseases and most self-rated their health positively (65.3%; 11.2% excellent and 54.1% good). Although most reported not smoking (98%) or consuming alcoholic beverages (99%), 83.7% did not practice physical activity and 78.6% reported not having seen a nutritionist during the pregnancy. Most reported iron and folic acid supplementation during the pregnancy (77.6%) (Table 2)

Table 2. Health-related, care-related and lifestyle characteristics of pregnant women in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil, 2022.

Variables	n°	%
Chronic noncommunicable disease		
Yes	20	20.4
No	78	79.6
Self-perception of health		
Excellent	11	11.2
Good	53	54.1
Fair	31	31.6
Poor	3	3.1
Smoker		
Yes	2	2.0
No	96	98.0
Alcohol consumption		
Yes	1	1.0
No	97	99.0
Practitioner of physical activity		
Yes	16	16.3
No	82	83.7
Appointment with nutritionist		
Yes	21	21.4
No	77	78.6
Iron and folic acid supplementation		
Yes, only iron	10	10.2
Yes, only folic acid	8	8.2
Yes, both	76	77.6
No supplementation	4	4.1

Most participants reported a preference for whole foods (84.7%). Among those who stated not having a preference (15.3%), 7.1% (n=7) reported not liking whole foods and 8.2% (n=8) reported not having access to such foods (data not presented in table). The majority reported using small quantities of oil, fats, salt and sugar throughout the day (81.6%) and 73.5% reported not planning meals (Table 3). Among the reasons for not planning meals, 47.2% (n=34) reported not having time and 52.8% (n=38) reported not having interest (data not presented in table).

With regards to the frequency of consuming ultra-processed foods, 60.2% reported only once per week. The majority reported a variety of choices at the place where they purchase foods (90.8%). In terms of nutritional status, 66.3% were either underweight or overweight and the majority had some degree of FI (79.6%) (Table 3).

Table 3. Dietary characteristics and nutritional status of pregnant women in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil, 2022.

Variables	n°	%
Preference for whole foods		
Yes	83	84.7
No	15	15.3
Uses small quantities of oil, fats, salt and sugar throughout the day		
Yes	80	81.6
No	18	18.4
Plans meals		
Yes	26	26.5
No	72	73.5
Frequency of consumption of ultra-processed foods		
Every day	16	16.3
3 times per week	23	23.5
Once per week	59	60.2
Place of purchase has variety of choices		
Yes	89	90.8
No	9	9.2
Nutritional status		
Underweight	19	19.4
Ideal range	33	33.7
Overweight	29	29.6
Obesity	17	17.3
Food security status		
Food security	20	20.4
Mild food insecurity	52	53.1
Moderate food insecurity	15	15.3
Severe food insecurity	11	11.2

With regards to associations between sociodemographic characteristics and FI status, 'income' had a *p*-value near the threshold of statistical significance (p=0.056). The prevalence of moderate to severe FI was higher among women whose family income was less than the monthly minimum wage. Being a beneficiary of governmental assistance program was associated with FI status (p=0.028), as the prevalence of moderate to severe FI was higher among beneficiaries (Table 4).

Table 4. Associations between sociodemographic characteristics and food security status among pregnant women in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil, 2022..

Variables	FS/Mild FI		Moderate/Severe FI		*p*-value
	n	%	n	%	
Age					
13 to 19 years	17	85.0	3	15.0	0.276
20 to 34 years	43	68.3	20	31.7	
35 years of older	12	80.0	3	20.0	
Marital status					
With spouse	52	78.8	14	21.2	0.087
Without spouse	20	62.5	12	37.5	
Race/Skin color					
White	13	81.2	3	18.8	0.282
Black	12	60.0	8	40.0	
Brown	47	75.8	15	24.2	
Family income					
Up to monthly minimum wage*	57	50.4	24	49.6	0.056
More than monthly minimum wage	15	88.2	2	11.8	
Occupation					
Employed	32	76.2	10	23.8	0.597
Not employed	40	71.4	16	28.6	
Schooling					
Illiterate	2	40.0	3	60.0	0.070
Incomplete primary school	17	63.0	10	37.0	
Complete primary or high school	48	78.7	13	21.3	
Higher education	5	100.0	0	0.0	
Residents in home					
1-3	51	75.0	17	25.0	0.605
≥4	21	70.0	9	30.0	
Beneficiary of governmental program					
No	43	82.7	9	17.3	0.028
Yes	29	63.0	17	37.0	

*monthly minimum wage: R$ 1212; FS: food security; FI: food insecurity

Table 5 displays the association between food security status and health-related, lifestyle and dietary characteristics. The prevalence of moderate to severe FI was higher (45.0%) among participants with chronic noncommunicable diseases (p=0.036). The planning of meals was not significantly associated with FI. A preference for whole foods had a p-value at the threshold of statistical significance (p=0.058), as the prevalence of moderate to severe FI was higher among participants who reported having such a preference (Table 5).

Table 5. Associations between food security status and health-related, lifestyle and dietary characteristics among pregnant women in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil, 2022..

Variables	FS/Mild FI		Moderate/Severe FI		p-value
	n	%	n	%	
Chronic noncommunicable disease					0.036
Yes	11	55.0	9	45.0	
No	61	78.2	17	21.8	
Self-rated health					0.144
Excellent	5	45.5	6	54.5	
Good	42	79.2	11	20.8	
Fair	23	74.2	8	25.8	
Poor	2	66.7	1	33.3	
Practitioner of physical activity					0.880
Yes	12	75.0	4	25.0	
No	60	73.2	22	26.8	
Plans meals					0.568
Yes	18	69.2	8	30.8	
No	54	75.0	18	25.0	
Preference for whole foods					0.058
Yes	58	69.9	25	30.1	
No	14	93.3	1	6.7	
Frequency of consumption of ultra-processed foods					0.984
Daily	12	75.0	4	25.0	
3x per week	17	73.9	6	26.1	
Once per week	43	72.9	16	27.1	
Variety of choice at place of purchase					0.628
Yes	66	74.2	23	25.8	
No	6	66.7	3	33.3	
Nutritional status					0.533
Underweight	14	73.7	5	26.3	
Ideal range	23	69.7	10	30.3	
Overweight	24	82.8	5	17.2	
Obesity	11	64.7	6	35.3	

FS; food security; FI: food insecurity

DISCUSSION

This study investigated sociodemographic, lifestyle and dietary characteristics as well as nutritional status in pregnant women at primary care units in a municipality in Northeast Brazil. The predominant findings were a complete primary or high school education, no employment, living with a partner/spouse and a family income up to the monthly minimum wage. Most participants had no chronic noncommunicable diseases despite having excess weight, which is a risk factor for the development of such diseases. Moreover, some degree of food insecurity (FI) was found in the vast majority of the sample (79.6%).

In the most recent health surveillance report (II VIGISAN),[4] family income (emphasized as the main associated factor), schooling, employment status, having children in the home, having debt and access to governmental aid programs were social characteristics directly associated with different degrees of access to food in the population. Thus, the authors of the present study presupposed that, as most of the pregnant women surveyed were Black and Brown with schooling up to a high school education and unemployed, they would be vulnerable to FI.

A systematic review conducted by Leal, Alencar & Montaño[11] showed that Northeast Brazil had the highest prevalence of FI (38.1%) among all regions of the country. The authors also reported a strong association with factors such as the COVID-19 pandemic, level of schooling and the weakening of public policies aimed at ensuring food security as exerting an influence on the increase in FI. The authors also report the negative impact on food insecurity related to the phenomenon of desertification, which is one of the characteristics of Northeast Brazil, along with irregular rainfall and high evaporation. Such issues may still be contributing to the increase in FI in the region, which may explain the high prevalence found in the present study, the descriptive analysis of which revealed that 79.6% of the pregnant women surveyed had some degree of FI.

More than half of the participants were Black and Brown and the majority reported a situation of moderate to severe FI. A study conducted in the state of Minas Gerais reported similar results, as 77% of the pregnant women analyzed were self-declared Black and Brown and had some degree of FI.

A study on food insecurity, food consumption and nutritional status among female beneficiaries of the Family Grant Program in the municipality of Palmeira das Missões in the state of Rio Grande do Sul (southern Brazil) found a high frequency of FI (91.5%), with rates of 29.9% and 15.9% of moderate and severe FI, respectively. A similar situation was found in the present investigation, as 37% of the participants who participated in some governmental aid program reported situations of moderate to severe FI. This may occur due to limited income and high food prices, resulting in the adoption of food choices with little variety, the minimal consumption of vegetables and high consumption of processed foods rich in sugars, saturated fat and sodium. Indeed, there is a relationship between FI and both poverty and the nutritional status of families, with a reduction in both the quantity and quality of foods.

A study conducted with families in the city of Salvador, state of Bahia, that investigated associations between race, gender and hunger found that income differences for the same occupation based on race is one of the persistent difficulties in the job market, fostering racial inequality, with negative impacts on Black families, who have less capacity for acquiring consumer goods and have access to adequate foods.[12]

Although some social advances have been made in an attempt to reduce inequities related to race, such as public policies like Law n° 12.711 from August of 2012, which addresses quotas,[13] conditions intrinsically related to social disparities remain. Thus, continuity is needed in movements and actions in the quest for equal opportunities to achieve a fairer society.[14] This underscores the importance of promoting and instituting intersectoral policies capable of ensuring this population the human right to adequate food.[15]

Income was at the threshold of statistical significance in the present study, which demonstrates how this factor is the social determinant most strongly related to access to food. A study conducted in the state of Pernambuco (Northeast Brazil) investigated social determinants associated with FI and found that income *per capita* was a decisive factor for improving the FI situation. Moreover, income was inversely proportional to FI, with a lower income related to a greater likelihood of acquiring less expensive foods, such as ultra-processed products.[16] A recent systematic review reported that FI was related to indicators of social inequalities, such as income, number of residents in the home, a lower level of schooling, etc., with income as the social indicator most strongly associated with FI.[17]

Most of the women surveyed reported no chronic noncommunicable diseases, which is a positive characteristic in this population. However, among those with such diseases, 45.0% were in situations of moderate to severe FI (p=0.036). This association demonstrates the influence of the nutritional transition process related to the modern, industrialized living standard, which interferes with the health and nutritional status of the population, aggravating socioeconomic disparities. Globalization has generalized access to ultra-processed foods, altering the eating habits of the population so that pre-ready-to-eat and ready-to-eat foods are considered preferable and are more affordable, making diet one of the main factors associated with the emergence and aggravation of chronic noncommunicable diseases. Lifestyle is also among the determinant factors, considering the high frequency of sedentarism among the participants in the present study, even those who reported being unemployed. Thus, reflections should be made on the interrelations of lifestyle, insufficient income and an increase in the consumption of ultra-processed foods, which are more affordable, and the emergence of chronic noncommunicable disease together with some degree of FI.[18,19]

CONCLUSION

The present findings demonstrate the magnitude of food insecurity among pregnant women at primary care units in the municipality of Santa Cruz, state of Rio Grande do Norte, Brazil. The association found between food insecurity and chronic no communicable diseases may be explained by the greater access to and consumption of ultra-processed foods.

The present study has limitations that should be considered. The small sample size was due to the logistics of visiting all basic care units for data collection, the lack of fixed days for pregnant women to be at the units and the few interviewers to administer the questionnaire, as the study was conducted with no funding from fostering agencies. Another limitation regards the difficulty in measuring food insecurity, which is influenced by diverse biopsychosocial factors and no single factor is capable of encompassing all dimensions of the outcome.

More active management of pregnancies is needed, with the implementation of intersectoral public policies to ensure the human right to adequate, healthy foods without compromising other needs related to quality of life, as established in the Brazilian Federal Constitution. An alignment is also needed between pregnancy and the planning and execution of food and nutritional education

activities for the population to obtain knowledge and achieve autonomy with regards healthier food choices.

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Contributors

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