

## Food and nutritional insecurity of families using the Family Health Strategy in two municipalities in Paraíba, Brazil

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**Abstract** *The objective of this article is to evaluate factors associated with food and nutritional insecurity in families with children under 5 years of age living in areas covered by the Family Health Strategy. Cross-sectional study involving 406 families from two municipalities in the Metropolitan Region of João Pessoa, Paraíba. The Brazilian Food Insecurity Scale was used to assess the families' food and nutritional security. The determinants of moderate/severe food insecurity were analyzed using the Decision Tree. Food and nutritional insecurity reached 71.4% of families. Moderate/severe food insecurity (32%) was primarily associated with the benefit of the Family Allowance (Bolsa Família) Program, and also with family composition consisting of children under 2 years of age, lower socioeconomic status, and family dysfunction. The results showed high prevalence of food and nutritional insecurity whose more serious levels suggest the importance of interventions aimed at improving the Family Allowance Program for the conditions of households with children under 2 years of age, socioeconomic situation of families, and functionality of families.*

**Key words** *Primary Health Care, Child, Food and nutrition security, Socioeconomic factors, Government programs*

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## Introduction

Access to food must be considered a human right to be promoted through public policies that pay attention to Food and Nutrition Security (FNS) with priority for the most vulnerable people, such as children under 5 years of age<sup>1</sup>. The violation of this right, as an important structural problem in society, threatens the health and nutrition conditions of the population<sup>2</sup>. In view of its importance, the promotion of FNS was placed as one of the global objectives of sustainable development, in which Brazil is engaged<sup>3</sup>.

Data from the Food and Agriculture Organization of the United Nations revealed that in 2017 approximately 821 million people worldwide - about one in nine - were unable to meet their basic food needs, representing an increase of 17 million in just one year. In Latin America and the Caribbean, the estimate was 39.3 million people, representing an increase of 400 thousand people since 2016<sup>1</sup>. In Brazil, the National Household Sample Survey (NHSS) identified 22.6% of households with some degree of Food and Nutritional Insecurity (FNI), according to the Brazilian Food Insecurity Scale (BFIS). The worst conditions were found especially in the North (36.1%) and the Northeast (38.1%) regions of the country. In the state of Paraíba, according to the NHSS, 41% of the households were in FNI, with 17.5% classified in the moderate/severe category<sup>4</sup>.

Food and nutrition insecurity is recognized as a complex and multidimensional phenomenon determined mainly by poverty and social inequalities, bringing negative repercussions on the most vulnerable groups<sup>5,6</sup>. In this context, the Conditional Cash Transfer Programs (CCTP) are considered social protection strategies to combat poverty and hunger that include conditions of participation associated with benefits in terms of nutrition, health and education<sup>7</sup>. The positive effects of these programs on FNS and access to health are suggested in the literature. However, there are also controversies regarding the impacts on the vaccination situation, food diversity, health status and children's growth. Thus, the impact paths of CCTP are not yet well defined<sup>8</sup>. In Brazil, the Family Allowance (Bolsa Família) Program (BFP) has brought benefits in FNS, not necessarily affecting nutritional quality<sup>9</sup>. The results of studies comparing families receiving the benefit with those not receiving it are not consistent. On the one hand, there is an adequate targeting of resources, however without improve-

ments to FNS. On the other hand, it is suggested that the correct targeting of the BFP positively impacts FNS, insofar as it affects families under greater social vulnerability<sup>6</sup>. In this sense, a systematic review of the literature showed increased chances of FNI in populations using public health services/beneficiaries of the BFP. It is also noteworthy that research on FNS in Brazil needs greater dynamism and integration between economic and social focuses<sup>5</sup>.

Although social support is one of the determinants of FNI<sup>10</sup>, it has been little explored in the scientific literature<sup>11</sup>. To the knowledge of the authors, only two articles were published addressing the results of some analysis in this regard with the Brazilian population<sup>11,12</sup>.

Identifying families with greater vulnerability to FNI and their associated factors is essential for assessing living conditions and planning interventions to promote health and fight hunger<sup>6</sup>. In this sense, families with children under 5 years old represent a group of considerable susceptibility. Children may also have their future productive capacity reduced as a consequence of the intergenerational transmission of socioeconomic inequality<sup>13</sup>.

In this context, the objective of this study was to assess the factors associated with the FNI of families with children under 5 years of age residing in areas covered by the Family Health Strategy, in municipalities where priority is given in the distribution of financial resources of the nutrition area.

## Methods

This is a cross-sectional study conducted with families residing in two municipalities in the state of Paraíba assisted by the Family Health Strategy (FHS), with children aged 0 to 59 months in the family nucleus. These municipalities were chosen because they are priority for actions aimed at preventing child overweight<sup>14</sup>. In addition, similarities were considered between them in terms of geographical location (in the metropolitan region of the capital of the state of Paraíba, with access to the network of services available there), social indicators (medium human development index), and coverage by the FHS (100%). According to population size, the municipality of Bayeux has a total population of 99,716 inhabitants and 7,862 children under 5 years of age, of whom 4,514 are beneficiaries of the BFP. The population of Cabedelo is made up of 57,994 in-

dividuals and 4,596 children under 5 years of age, of which 2,553 have the benefit of CCTP. Both municipalities have three Family Health Support Nuclei (FHSN), with 28 and 20 FHS teams in each municipality, with arrangements from both conventional and *Mais Médicos* (More Doctors) Program teams.

Six conventional and six *Mais Médicos* (More Doctors) Program teams from each municipality, thus a total of twelve teams, were selected to participate in the research. They were randomly selected among teams linked to the same FHSN.

To calculate the sample size, the prevalence of moderate/severe food insecurity of 31.6% was adopted among families that use public health services or are beneficiaries of the BFP<sup>5</sup>. Considering a population of 12,458, a maximum sampling error of 5% at 95% significance level, 25% to compensate for possible losses and control of confounding factors, it was estimated that 431 families had to be studied (18 families/team).

Families were randomly selected during routine care or childcare consultations for children under 5 years old, until the number established per each team was completed. In the case of teams in which the number of consultations for children was low, active search was carried out in the households, based on the team's records and a random selection of families.

Data were collected in health units, in the second half of 2017, by interviews conducted by the researchers (health professionals and students) who had previous experience in fieldwork, supervised by a trained professional. The quality control of the study included: training and standardization of interviewers, building of a Manual of Instructions, and realization of a pilot study in the city of Campina Grande, Paraíba. The data collection instrument included the diagnosis of FNS of each family (dependent variable) and the application of a structured questionnaire to the mothers covering information related to: i. maternal and child profile (sex and age of the child, gestational age, birth weight, anthropometric nutritional status of the mother); ii. access to health services (trimester of initiation of prenatal consultations, number of prenatal consultations, type of health team as to the performance of a nutritionist), and social programs (access of the child to daycare, benefit of the BFP); iii. social support (presence of mother's partner, family function), and iv. family socioeconomic status (mother's work outside the home, socioeconomic classification). The child's age, gestational age and birth weight were obtained through infor-

mation provided by the mother and/or consultation of the Child Health Handbook. Children born before the 37<sup>th</sup> week of gestation and/or with birth weight < 2,500g were classified as premature and/or presenting low birth weight. Prenatal care was considered inappropriate if started after the first trimester of pregnancy and when the number of consultations was less than six<sup>15</sup>.

Standardized equipment and techniques were used to assess the mothers' nutritional status<sup>16</sup>. Height was measured using a stadiometer (WCS<sup>®</sup>) with a scale in millimeters (mm). Weight was measured using a platform-type electronic scale with a capacity of 150 kg and 100g graduation (Tanita UM-080<sup>®</sup>). All measurements were made twice and the average was recorded. Short stature was defined by the cutoff point of 155.0 cm, which corresponds to the fifth percentile of the height-to-age ratio, considering the age of 20 years or more, according to the National Center for Health Statistics (CDC Growth Charts. [Http://www.cdc.gov/growthcharts/cdc\\_charts.htm](http://www.cdc.gov/growthcharts/cdc_charts.htm), accessed September 18, 2018). The Body Mass Index was calculated as the ratio between weight (kg) and height (m) squared, using the following cutoff points: low weight (< 18.5), adequate (18.5 – 24.9) and overweight/obesity ( $\geq 25$ )<sup>16</sup>.

To assess family functionality, the Family APGAR questionnaire was used<sup>17</sup>. This instrument consists of five questions, one for each domain to be assessed: *adaptation*, which includes the family resources offered when assistance is needed; *partnership*, which refers to reciprocity in family communications and problem solving; *growth*, related to the family's willingness for role changes and emotional development; *affection*, including intimacy and emotional interactions in the family context; and *resolve*, which is associated with decision, determination or resolvability in the family unit. The questionnaire has three answer options (always, indicated by two points; sometimes, indicated by one point; and never), and the total score ranges from 0 to 10. Families with scores from 0 to 3 are classified as having high family dysfunction; from 4 to 6, moderate family dysfunction; and from 7 to 10, good family functionality<sup>17,18</sup>.

The socioeconomic classification of each family was based on the criteria of the Brazilian Association of Research Companies<sup>19</sup>, which is used to estimate the purchasing power of Brazilian families. The aspects considered in this classification are the existence of a toilet in the house, the hiring of a maid, the possession of goods, the education level of the head of the family, and the

access to public services. Families were classified into the following classes: high (score 29 to 100), intermediate (score 17 to 28) and low (score 0 to 16) socioeconomic status. For analysis purposes, the upper and middle classes were merged.

The FNS situation of families was assessed using the Brazilian Food Insecurity Scale (BFIS), which has 14 items<sup>20</sup>. This is a validated scale that makes it possible to classify families into different degrees of food insecurity: food security is indicated by negative answers to all questions; mild food insecurity is indicated by positive answers to up to five questions; moderate food insecurity is indicated by positive answers to six to nine questions; and severe food insecurity is indicated by positive answers to 10 to 14 questions.

The independent variables were the following: child's sex and age; prematurity and/or low birth weight; mother's height and body mass index; adequacy of prenatal care; type of FHS team (with or without a nutritionist); child attendance to daycare; BFP benefit; presence of mother's partner; family functionality; mother's work outside the home; socioeconomic classification of the family; and municipality of residence. Food and nutrition security was the dependent variable of the study, and it was dichotomized in food security/mild food insecurity and moderate/severe food insecurity.

The collected data were organized in electronic spreadsheets and double typed in a customized database with consistency checks and interval restrictions. The dataset produced after analysis of consistency of the data entered was used for statistical analysis.

Absolute frequencies and percentages of all variables under study were initially calculated. Then, a bivariate analysis was made to test the association between the level of FNS and all independent variables using the Chi-square test. All variables were inserted into a Decision Tree model using the CHAID algorithm in order to explain moderate/severe food insecurity.

The Decision Tree consists of decision rules that make successive divisions in a dataset, in order to make it more and more homogeneous with respect to the dependent variable. The technique facilitates the identification of the most relevant variables for the description of a problem and of hierarchical relationships, which can be used to support decisions related to health. For these purposes, the following main components of a problem are graphically described: the model itself, the probabilities of occurrence of the modeled events, and the outcome values

that exist at the end of each course. The analysis has the ability to efficiently segment populations into significant subsets, allowing the identification of marginalized segments, which can be used for the effective targeting of resources and intervention measures. In this way, the analysis allows inferences that are not admissible based on the results of the regression model in which decisions are aimed at the average member of the population, without taking into account the population subgroups as the main target<sup>21,22</sup>.

The Decision Tree was built using a graph that starts with a root node, in which all the observations in the sample are presented. Sequentially produced nodes represent subdivisions of data into increasingly homogeneous groups, called child nodes. When there is no more possibility of division, end nodes or leaves are obtained<sup>23</sup>. The model was adjusted by successive binary divisions (nodes) in the data sets. The stop criterion adopted was the p-value < 0.05 of the  $\chi^2$  statistic using the Bonferroni correction. The goodness-of-fit of the final model was evaluated by the general risk estimate, which compares the difference between the expected and the observed values in the model, indicating the extent to which the tree correctly predicts the outcomes. Only variables with an adjusted p-value < 0.05 remained in the final graph.

Statistical analyzes were performed using the SPSS (Statistical Package for Social Sciences) software version 20.0 (SPSS Inc., Chicago, United States).

The Project was approved by the Research Ethics Committee of the State University of Paraíba. All research participants signed the Informed Consent Form, a necessary condition for participation in the study.

## Results

Four hundred and six families with children under 5 years of age participated in the study. According to the BFIS, 71.9% of the families had some degree of FNI, 75.9% in the municipality of Bayeux and 67.0% in the municipality of Cabedelo. In Bayeux, the prevalence of mild, moderate and severe food insecurity was 38.8%, 20.6% and 16.5%, respectively, while in Cabedelo they were 41.2%, 13.4% and 12.4%. A total of 32% of families were diagnosed with moderate/severe food insecurity (Figure 1).

Among the total of families, 247 (60.8%) had children under 2 years of age in their nucleus,

and 208 (51.2%) of the children were of male sex. As for maternal nutritional status, there was a significant prevalence of height (35.5%) and weight (50.5%) deficit, as well as overweight/obesity (13.6%). Most families were classified as beneficiaries of the BFP (60.1%), highly functional (67.0%), and of low socioeconomic class (64.0%) (Table 1).

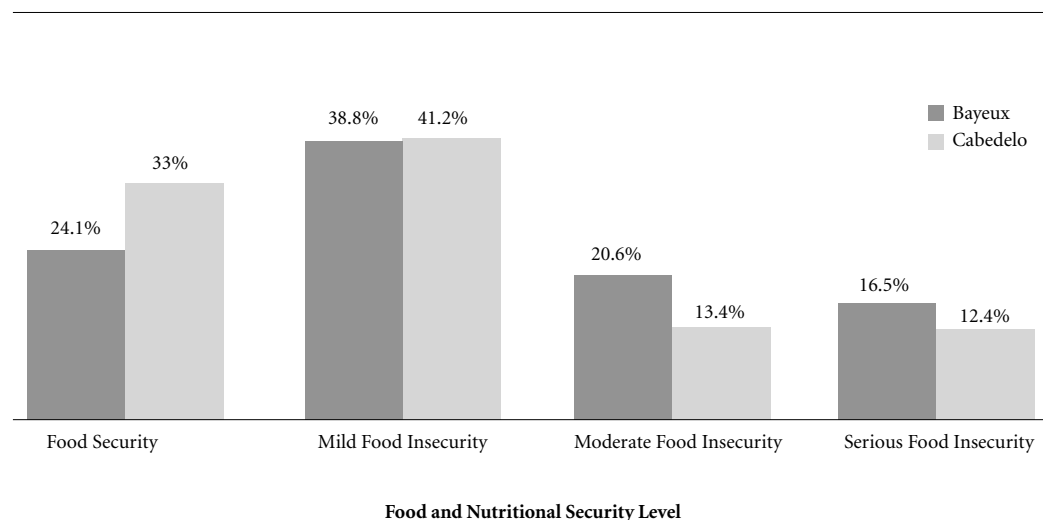
Regarding the bivariate analyses (Table 1), it was observed that prematurity and/or with low birth weight ( $p = 0.027$ ), inadequate prenatal care ( $p = 0.018$ ) and absence of a nutritionist in the health teams ( $p = 0.016$ ) represented exposures associated with moderate/severe food insecurity. In relation to social programs, social support and socioeconomic situation, higher prevalence values of moderate/severe food insecurity were found in the following cases: child attending daycare, benefit of the BFP, family classified as having severe dysfunction, mother not working outside the home, and low socioeconomic class. In addition, moderate/severe food insecurity was more frequent among families residing in the municipality of Bayeux.

The final Decision Tree model was built by 13 nodes, as shown in Figure 2. According to the model, the variable that most interfered in the presence of moderate/severe food insecurity was being a beneficiary of the BFP ( $p < 0.001$ ); the outcome was observed with a prevalence of 41.8% among beneficiary families and 17.3%

among non-beneficiary ones. In the case of beneficiary families, the presence of children under 2 years of age in the family nucleus had an important influence on the prevalence of moderate/severe food insecurity ( $p = 0.044$ ) and, in these, families characterized as presenting severe dysfunction ( $p = 0.008$ ) also represented a relevant factor. The influence of the municipality of residence was restricted to families with children aged 2 years and over. In turn, in families not benefited by the BFP, those of low socioeconomic status had a higher prevalence of moderate/severe food insecurity ( $p = 0.023$ ). In addition, in the child node for the best socioeconomic condition, family functionality influenced the prevalence of moderate/severe food insecurity ( $p = 0.001$ ), with a prevalence of 38.5% among families with moderate/severe dysfunction and only 5.3% among the highly functional ones.

## Discussion

In order to identify factors associated with FNI, this study used a multivariate Decision Tree model. Based on the tree diagram, it was possible to identify subgroups of families with specific profiles that should be the target of strategies to strengthen FNS, with highlighting the importance of strengthening the attention among BFP beneficiaries. In this group, families with children



**Figure 1.** Prevalence of Food and Nutritional Security in families with children under five years of age living in two municipalities in the state of Paraíba, 2017.

**Table 1.** Food and Nutritional Security situation, according to the maternal and child profile, access to health services and social programs, social support and socioeconomic situation, in families with children under five years of age living in two municipalities in the state of Paraíba, 2017.

Variables	Total n (%)	Food and nutrition security		p-value
		Level A n (%)	Level B n (%)	
<b>Maternal and child profile</b>				
Child's age (years)				0.843
≥ 2	159 (39.2)	109 (68.6)	50 (31.4)	
< 2	247 (60.8)	167 (67.6)	80 (32.4)	
Child's sex				0.349
Male	208 (51.2)	137 (65.9)	71 (34.1)	
Feminine	198 (48.8)	139 (70.2)	59 (29.8)	
Prematurity and/or low birth weight				0.027
No	329 (81.4)	232 (70.5)	97 (29.5)	
Yes (birth before the 37 <sup>th</sup> week of pregnancy and/or weighing < 2,500g)	75 (18.6)	43 (57.3)	32 (42.7)	
Mother's height (cm)				0.190
Adequate	262 (64.5)	184 (70.2)	78 (29.8)	
Inadequate (< 155.0)	144 (35.5)	92 (63.9)	52 (36.1)	
Mother's Body Mass Index (Kg/m <sup>2</sup> )				0.413
Adequate	146 (35.9)	105 (71.9)	41 (28.1)	
Weight deficit (<18.5)	205 (50.5)	136 (66.3)	69 (33.7)	
Overweight/obesity (≥ 25)	55 (13.6)	35 (63.6)	20 (36.4)	
<b>Access to health services</b>				
Adequacy of early prenatal care				0.018
Adequate	300 (75.2)	214 (71.3)	86 (28.7)	
Inadequate (started after the first trimester of pregnancy and number of consultations < 6)	99 (24.8)	58 (58.6)	41 (41.4)	
Type of healthcare team				0.016
With a nutritionist	182 (44.8)	135 (74.2)	47 (25.8)	
Without a nutritionist	224 (55.2)	141 (62.9)	83 (37.1)	
<b>Access to social programs</b>				
Child attendance to daycare				0.039
Yes	131 (32.3)	80 (61.1)	51 (38.9)	
No	275 (67.7)	196 (71.3)	79 (28.7)	
Benefit from the Bolsa Família Program				< 0.001
Yes	244 (60.1)	142 (58.2)	102 (41.8)	
No	162 (39.9)	134 (82.7)	28 (17.3)	
<b>Social support</b>				
Presence of mother's partner				0.058
Yes	308 (75.9)	217 (70.5)	91 (29.5)	
No	98 (24.1)	59 (60.2)	39 (39.8)	
Family functionality				< 0.001
High functionality	272 (67.0)	202 (74.3)	70 (25.7)	
Moderate dysfunction	97 (23.9)	56 (57.7)	41 (42.3)	
Severe dysfunction	37 (9.1)	18 (48.6)	19 (51.4)	

it continues

**Table 1.** Food and Nutritional Security situation, according to the maternal and child profile, access to health services and social programs, social support and socioeconomic situation, in families with children under five years of age living in two municipalities in the state of Paraíba, 2017.

Variables	Total n (%)	Food and nutrition security		p-value
		Level A n (%)	Level B n (%)	
<b>Socioeconomic situation</b>				
Mother's work outside the home				0.021
Yes	108 (26.6)	83 (76.9)	25 (23.1)	
No	298 (73.4)	193 (64.8)	105 (35.2)	
Family socioeconomic classification				< 0.001
Middle/upper class	146 (36.0)	121 (82.9)	25 (17.1)	
Low class	260 (64.0)	155 (59.6)	105 (40.4)	
Municipality of residence				0.016
Bayeux	224 (55.2)	141 (62.9)	83 (37.1)	
Cabedelo	182 (44.8)	135 (74.2)	47 (25.8)	

Level A: Food security/mild food insecurity, Level B: Moderate/severe food insecurity, p-value: statistical significance value according to the Chi-square test; p-value < 0.05.

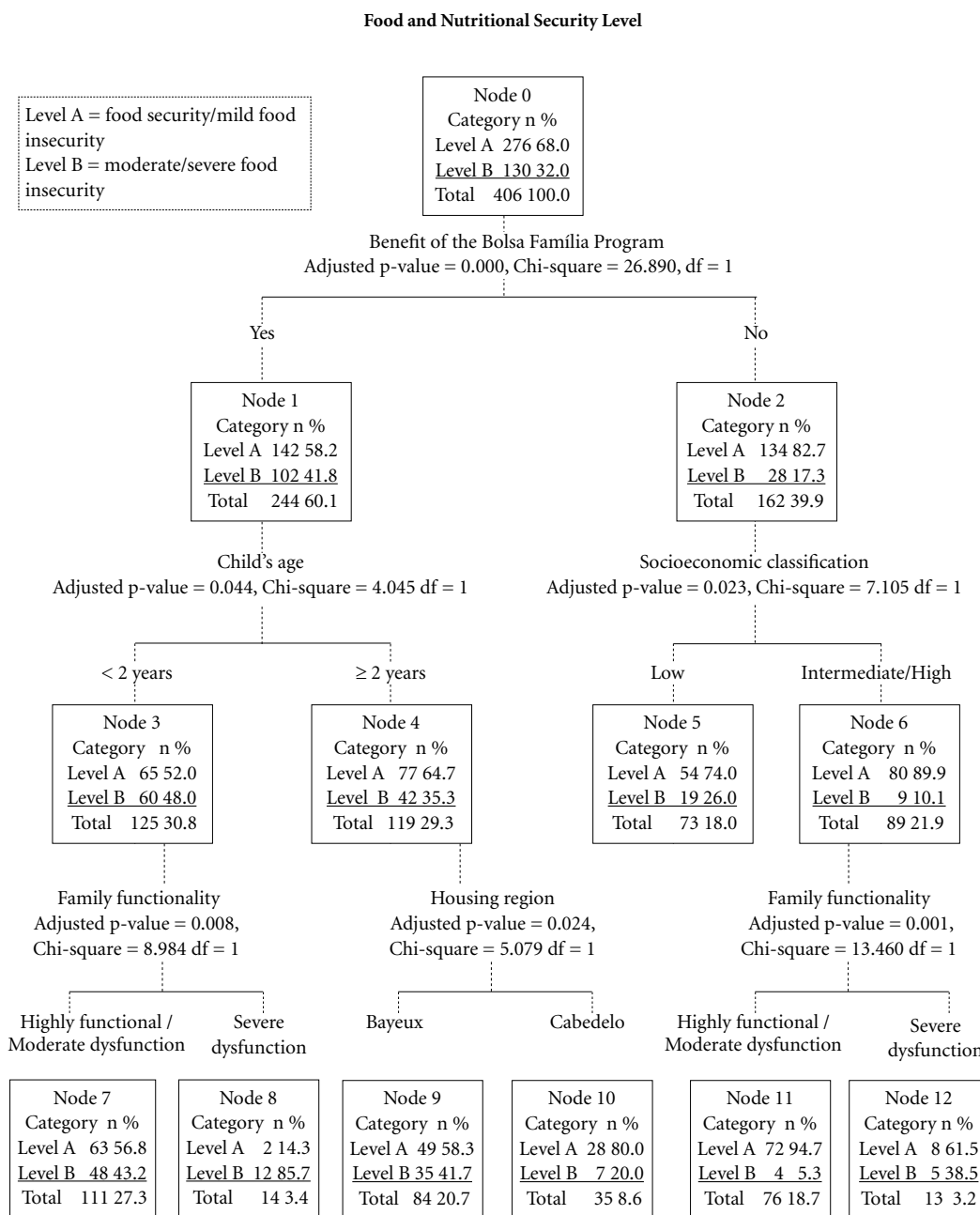
under 2 years of age, and among these, the ones characterized by lesser social support, represented important distinctions for decisions related to targeting processes. It is worth noting the ease of identifying families with such characteristics. This work opens perspectives for new studies using predictive approaches on FNI and its social determinants, through the adoption of data science techniques applied to health.

The prevalence of FNI (71.4%) in the studied population was higher than that reported nationally in the NHSS (22.6%)<sup>4</sup>. However, it is close to that reported in families with children under 5 years of age in the state of Maranhão (70.4%)<sup>24</sup> and in the municipality of Campina Grande-PB (69.2%)<sup>6</sup>. This does not seem to be a public health problem in Brazil only; there was a similar prevalence of FNI in Mexico (75.7%)<sup>25</sup> and in southern Ethiopia (75.8%)<sup>26</sup>, for example. The prevalence of moderate/severe food insecurity recorded in the present survey (32%) is higher than that observed nationally (7.8%) and in the state of Paraíba (13.0%)<sup>4</sup>, and similar to that found in researches in the field developed with families from the three health regions known to be of low socioeconomic status in Campinas-SP (35.0%)<sup>27</sup>, with children assisted in municipal public daycare centers in Campina Grande-PB (31.6%)<sup>6</sup>, and with children of low socioeconomic class assisted by the FHS of the Southeast region of Teresina-PI (29.4%)<sup>28</sup>. These findings

should be a cause for concern because children who experience significant quantitative food restriction, or episodes that constitute hunger, have worse health conditions in childhood<sup>13</sup>.

In the Decision Tree, it was possible to observe a higher prevalence of moderate/severe food insecurity among families benefiting from the BFP, which reinforces previous findings based on national data<sup>13,29</sup> and studies of local scope<sup>28,30</sup>. The present results also converge with those of a literature review that pointed to greater chances of moderate food insecurity among health service users/BFP beneficiaries when compared to reference populations<sup>5</sup>. These findings suggest that there is an appropriate destination of BFP resources, but improvements in FNS is not achieved<sup>5,6,9</sup>. In view of this scenario, it is essential to emphasize the importance of associating the monetary benefit with investments in the sectors of health, education, generation of work and income, in order to reduce the situation of family vulnerability<sup>31</sup>. Similar results were also registered in relation to CCTP in Mexico, whose authors reinforce the possible consequences of these programs on the prevalence of overweight/obesity and, therefore, the inclusion of obesity prevention strategies as one of their essential components<sup>32</sup>.

Among BFP beneficiaries, the highest probability of moderate/severe food insecurity occurred in families with children under 2 years of



DF: degrees of freedom.

**Figure 2.** Multivariate analysis using the Decision Tree (CHAID) for moderate/severe food insecurity, adjusted by the investigated factors, in families with children under five years of age living in two municipalities in the state of Paraiba, 2017.

age. A previous study based on national data with families with children less than 2 years of age highlighted that CCTP benefits prioritized families under moderate and severe food insecurity<sup>33</sup>. In

this sense, the practice of breastfeeding is recommended as a way of protection against the adverse condition of food restriction and/or deprivation and as a way of promoting the FNS of these chil-



dren<sup>34</sup>. Furthermore, food and nutrition education that supports the choice of healthy foods is also of great importance, especially for women who are usually responsible for food and child care, as well as the holders of the BFP benefit<sup>13</sup>.

In this study, the characterization of families as presenting severe or moderate/severe dysfunction was relevant in the condition of moderate/severe food insecurity in households with children under 2 years of age, supported by the BFP, and of intermediate/high socioeconomic level, without the BFP benefit, respectively. Despite the scarce and controversial literature on the subject<sup>11</sup>, these results find explanations for the importance of social support in the quantity and/or quality of food, either through the provision of resources or by providing positive feelings, such as feeling of being cared for, loved or having someone to count on, which can improve the ability to deal with stressful events<sup>11,12</sup>. In addition, FNI situations can also be faced with aid of people who can provide information and guidance<sup>12</sup> and social and community relations, particularly in terms of resources that may help vulnerable groups<sup>11</sup>. Findings similar to those of this study were previously found in other places in Brazil<sup>11,12</sup>.

The results of this research, specifically in the group of non-beneficiaries of the BFP, are in line with those of other studies that showed the socioeconomic determination of FNI in Brazilian families, as expected<sup>6,27,28,31</sup>. In a coherent manner, results from analyzes of trends and factors associated with FNI in Brazil in 2004, 2009 and 2013 showed the influence of variables related to the socioeconomic situation of families, as well as less advances among families of the strata under greater social, economic and demographic vulnerability<sup>2</sup>. In a systematic review of FNI in different epidemiological contexts in Brazil, the variable that had the greatest association with this outcome was worst family income, and groups in social iniquity were the most affected, reinforcing the social and economic situation related to hunger<sup>5</sup>. Similar to the prevailing circumstances among the Brazilian population, surveys conducted in France<sup>35</sup> and Mexico<sup>32</sup> showed that socioeconomic situations of greatest vulnerabili-

ty were found among families living under FNI, based on possession of consumer goods and an index of socioeconomic status, respectively. The importance of socioeconomic status in purchasing power, including to buy food, explains the relationship of FNI with various household determinants of a social nature<sup>2</sup> and its usefulness as an indicator of iniquity<sup>5</sup>.

The municipality of residence also influenced the prevalence of FNI, possibly because the more precarious living conditions were present in the studied population living in the city with worst human development<sup>30</sup>. The municipality of Bayeux (presenting a medium municipal human development index of 0.649 and per capita income of R\$ 376.74) is characterized by having more unfavorable socioeconomic indicators when compared from Cabedelo (presenting a high municipal human development index of 0.748 and per capita income of R\$ 1,036.21) (<http://www.atlasbrasil.org.br/2013/>, accessed on May 01, 2019).

Among the study limitations, the fear that some families have in answering questions of the BFIS stands out. However, as the participants learned about the objectives and the importance of the research, they felt more secure in responding to the interviewers. Moreover, the BFIS is an easily understood instrument, widely used in research, including in national surveys, which allows comparisons with data from the literature.

## Conclusion

The results of the present study showed that seven out of every ten families with children under 5 years of age who use the FHS lived in FNI, of which three out of every ten were in moderate/severe food insecurity. Among these families, moderate/severe food insecurity was more relevantly related to the benefit of the BFP, suggesting that this program correctly benefits families, but does not improve access to food. In addition, other household determinants of FNS stood out, namely, the presence of children under 2 years of age in the family nucleus, family dysfunction, and the lower socioeconomic level.

## Collaborations

EES Santos, MM Oliveira and IM Bernardino participated in the analysis and interpretation of data, writing and final review of the article. D Figueroa Pedraza participated in the preparation of the study protocol, article design, data analysis and interpretation, writing and final review of the article.

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