Determinants of Food Insecurity in Residences with Children from 0 To 36 Months

Determinantes da Insegurança Alimentar Em Residências com Crianças de 0 a 36 Meses

Determinantes de la Inseguridad Alimentaria en Residencias con Niños de 0 a 36 Meses

RESUMO

Objetivo: Analisar a associação de fatores sociodemográficos, econômicos e de condições de vida com o risco de insegurança alimentar em domicílios com crianças de 0 a 36 meses. **Método:** Estudo transversal, conduzido com domicílios com crianças nascidas nos anos de 2019, 2020 e 2021. Foram analisados 305 domicílios e reportados dados dos seus responsáveis e crianças. Modelo de regressão logística, ajustado, foi construído. **Resultados:** Um terço dos domicílios está em risco de insegurança alimentar. Foi observado um maior risco naqueles maiores de 30 anos e naqueles que referiram receber auxílio Bolsa Família (p <0,05), enquanto aqueles com união estável e renda acima de um salário mínimo brasileiro (p < 0,05) apresentaram menores chances de insegurança alimentar. **Conclusão:** O risco de IA no domicílio foi elevado o que demonstra a necessidade de estratégias e ações que diminuem esse risco em domicílios de baixa renda.

DESCRITORES: Insegurança alimentar. Primeira infância. Domicílios. Condições de vida. Fome

ABSTRACT

Objective: To analyze the association of sociodemographic, economic, and living condition factors with the risk of food insecurity in households with children aged 0 to 36 months. **Methods:** A cross-sectional study was conducted with households that had children born in 2019, 2020, and 2021. Data from 305 households, including information about caregivers and children, were analyzed. An adjusted logistic regression model was constructed. **Results:** One-third of the households were at risk of food insecurity. A higher risk was observed among individuals over 30 years of age and those who reported receiving Bolsa Família assistance (p < 0.05), while those with a stable union and an income above the Brazilian minimum wage (p < 0.05) had lower odds of food insecurity. **Conclusion:** The risk of household food insecurity was high, highlighting the need for strategies and actions to reduce this risk in low-income households.

DESCRIPTORS: Food insecurity. Early childhood. Households. Life conditions. Hunger

RESUMEN

Objetivo: Analizar la asociación de factores sociodemográficos, económicos y de condiciones de vida con el riesgo de inseguridad alimentaria en hogares con niños de 0 a 36 meses. **Métodos:** Estudio transversal realizado en hogares con niños nacidos en los años 2019, 2020 y 2021. Se analizaron datos de 305 hogares, incluyendo información de sus responsables y niños. Se construyó un modelo de regresión logística ajustado. **Resultados:** Un tercio de los hogares presentó riesgo de inseguridad alimentaria. Se observó un mayor riesgo entre los mayores de 30 años y aquellos que informaron recibir asistencia del programa Bolsa Familia (p < 0,05), mientras que aquellos con unión estable y con ingresos superiores a un salario mínimo brasileño (p < 0,05) presentaron menores probabilidades de inseguridad alimentaria. **Conclusión:** El riesgo de inseguridad alimentaria en los hogares fue elevado, lo que resalta la necesidad de estrategias y acciones para reducir este riesgo en hogares de bajos ingresos.

DESCRIPTORES: Inseguridad alimentaria. Niñez temprana. Hogares. Condiciones de vida. Hambre

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INTRODUCTION

Worldwide, figures for the year 2022 indicate that hunger affects an average of 735 million people [1]. In Brazil, around 33 million people are going hungry [2]. Although Brazil left the hunger map in 2014 [3] and has prospects of consolidating its position as one of the world's leading countries in terms of food security, the situation has worsened in our country due to economic and political factors [4], making it important to promote food security.

Food and Nutrition Security (FNS) is defined as ensuring that everyone has access to basic foodstuffs of sufficient quality and quantity, at all times and in such a way that access to other basic needs is not compromised [5]. On the other hand, FI is a progression of events that begins with the concern of family members to have access to the food they need, reaching the level of compromise (6).

Globally, AI affects around 2.4 billion people [1]. In Brazil, data from the 2017-2018 POF [7] indicated that 36.7% of households had some level of FI, with severe FI being observed in 10.3 million people. More recent data, although indicating a reduction in the number of severely food insecure individuals, show that 2.5 million people still go a whole day or more without food in Brazil [3].

Individuals at risk of severe FI have a low energy intake, reduced macronutrient intake and inadequate vitamin and mineral intake [8]. In children, sub-optimal intake of energy, protein and micronutrients in the first five years of life has an impact on physical and psychological development, which can have repercussions throughout life, compromising the cognitive functioning of these individuals [9]. FI in early childhood can have negative implications, going beyond physical health to socio-emotional development [10].

Although the data shows that FI does not occur equally between the regions of the country, the more developed regions are also affected in terms of access to adequate food [11]. In Lavras, a municipality located in the south of the state of Minas Gerais, socioeconomic conditions and dependence on government benefits are a common reality in towns far from large urban centers [12]. However, data on households with children under the age of 3 is incipient in the literature.

Studies that seek to identify FI conditions and associated factors in medium-sized cities are important in order to generate scientific evidence to support new strategies and the allocation of resources for the adoption of public policies to promote health and prevent diseases in children. Therefore, in order to contribute to understanding the AI map in Brazil, this study aims to analyze the association of sociodemographic, economic and living conditions factors with the risk of AI in households with children aged 0 to 36 months in a medium-sized municipality in Minas Gerais.

METHOD

This is a cross-sectional study that used data from the baseline of the research "Child Health Handbook: Implications for Food and Nutrition Security in Early Childhood", which evaluated, in particular, the dimension of Food and Nutrition Security (FNS). All the procedures established by National Health Council Resolution 466/2012 and other rules in force in Brazilian legislation were followed. The study was submitted to and approved by the Research Ethics Committee of the Federal University XXXXXX (CAAE nº XXXXXXX,

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opinion nº XXXXXXX).

The study was carried out in the city of Lavras, located in the south of Minas Gerais. According to data from 2022, the population of the municipality is 104,761 inhabitants, with 5,780 children aged 0 to 4 (5.52% of the total population). The average salary of formal workers is 2.5 minimum wages, and the municipality has a Municipal Human Development Index (MHDI) of 0.78 [13]. Primary Health Care coverage is 57%, with 19 Family Health Strategies (ESF) operating in the territory.

All families with children aged 0 to 36 months registered with the FHS were eligible. The number of families was defined considering live births in 2019 (1,456), 2020 (1,374) and 2021 (1,309), totaling 4,139 live births. For the sample calculation, the formula for simple proportion samples was used, considering a prevalence of severe FI of 18.1% in Brazilian children [2], a 95% confidence level and a margin of error of 4.5%. The calculation resulted in a sample of 282 children. As the population of children in Lavras is finite, the correction formula for limited populations was applied, resulting in a final number of 264 children. The sample was non-probabilistic, including all children who attended appointments at the ESF or were visited at home, and 305 families were assessed.

Data collection began by obtaining secondary information from the Health Department and/or the ESF units, including the child's name, date of birth and address. Based on these records, data was collected during pediatric care days at the ESF and/or during home visits, between March and October 2022. The collection team was made up of students who had previously been trained to apply the instruments. After the research objectives and procedures were presented, those who agreed to take part signed the Informed Consent Form and, where applicable, the Assent Form, and the collection began.

To assess the risk of household FI, we used the Food Insecurity Risk Screening Tool (TRIA), validated for the Brazilian population (5,6,14). The TRIA consists of two questions: "1. In the last three months, did you run out of food before you had money to buy more food? (No/Yes)" and "2. In the last three months, did you eat only some of the food you still had because you ran out of money? (No/Yes)". The presence of positive answers ("Yes") to both questions characterized the household as being at risk of FI.

The independent variables were: mother's age (categorized as "≤ 30 years" and "> 30 years"); self-reported skin color (categorized as "white" and "non-white"); marital status (categorized as "single" and "stable union"); education level of the head of household (categorized as "< 9 years", "9 to 12 years" and "> 12 years"); current occupation of the head of household (categorized as "no occupation" and "paid work"); total family income in minimum wages (categorized as "< 1 minimum wage", "1 to 2 minimum wages" and "> 2 minimum wages"); number of residents in the household (categorized as "≤ 3 residents" and "≥ 4 residents"); receipt of a green basket and/or basic food basket (categorized as "no" and "yes"); child's birth weight (categorized as "≤ 2.500 g" and "> 2,500 g"); the mother's nutritional status (categorized as "normal" and "overweight"); the condition of the home's sewage system (categorized as "closed" and "open"); current smoking (categorized as "no" and "yes"); and current alcohol consumption (categorized as "no" and "yes").

Anthropometric data was obtained using a pediatric scale (for children under 24 months) and a WiSO digital scale (W801), with a maximum capacity of 180 kg and precision of 100 g, for other children and adults. Height was measured using the Altura Exata digital portable stadiometer, with a scale in centimeters and precision of 1 mm. Based on these measurements, the guardian's nutritional status was calculated using the body mass index (BMI = body mass/height², in square meters), following the recommended protocol (15). For the analyses, nutritional status was categorized as normal (< 25 kg/m²) and overweight (≥ 25 kg/m²).

Quality control, data entry and consistency checks were carried out. The data was double-entered using the EpiInfo® program in order to identify errors. The sample was described by presenting the absolute and relative frequencies of the outcome and independent variables. Binary logistic regression was used to estimate the crude and adjusted odds ratios (OR), with their respective 95% confidence intervals (95%CI). Variables associated with the outcome at a significance level of $p < 0.20$ were included in the multiple analysis. The final model was built using the backward method, in which variables were removed one by one until only those associated with the outcome with $p < 0.05$ remained. Statistical analyses were carried out using the Statistical Software for Professional (STATA) program, version 13.1.

RESULTS

305 families took part in the study, with the average age of the mother being 29.8 years (±9.7 years). One third of the households were at risk of FI (33.77%). Losses to follow-up in relation to the FI assessment were not significant ($p = 0.493$). The characteristics of the guardians, the household and the child are described in Table 1.

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TABLE 1 - Characteristics of households, guardians and children in Lavras, MG, Brazil, 2022

Variables	n	%
Mother's age		
≤ 30 years	185	60,66
> 30 years	120	39,34
Self-reported skin color		
White	76	24,92
Not white	229	75,08
Marital status		
Single	129	42,30
Stable union	176	57,70
Responsible person's schooling		
< 9 years	71	23,28
9 - 12 years	92	30,16
> 12 years	142	46,56
Current occupation of the person responsible for the household		
No occupation	147	48,20
Paid work	158	51,80
Total family income in Brazilian minimum wage		
< 1 minimum wage	65	21,31
1 - 2 minimum wages	128	41,97
> 2 minimum wages	112	36,72
Number of residents		
≤ 3 residents	98	32,13
≥ 4 residents	207	67,87
Receipt of family allowance		
No	206	67,54
Yes	99	32,46
Green basket/basic basket		
No	271	88,85
Yes	34	11,15
Child's birth weight		
≤ 2500grams	41	13,44
> 2500 grams	264	86,56

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Mothers' nutritional status		
Normal	138	45,25
Excess weight	167	54,75
Sewage conditions in the home		
Closed	294	96,39
Open	11	3,61
Current smoking		
No	269	88,20
Yes	36	11,80
Current alcohol consumption		
No	213	69,84
Yes	92	30,16
Food insecurity (number of households)		
No	202	66,23
Yes	103	33,77

Source: Prepared by the authors based on survey data.

Those who self-declared their color as non-white ($p < 0.01$) were more likely to be at risk of FI in the household, as were those who reported receiving Bolsa Família ($p < 0.01$) and who indicated the green basket as the source of their food ($p < 0.01$). On the other hand, those in a stable union ($p < 0.01$), with more than 9 years of schooling ($p = 0.01$), who have a paid job ($p = 0.04$) and an income of more than 1 minimum wage ($p < 0.01$) were less likely to be at risk of FI in the household.

TABLE 2 - Odds Ratio and 95% confidence interval in the crude analysis of variables related to the risk of household food insecurity in Lavras, MG, Brazil.

Mother's age	OR	95% CI	p
≤ 30 years			
> 30 years	1	1	0,16
Self-reported skin color	1,42	0,87 – 2,33	
White			
Not white	1	1	<0,01
Marital status	2,30	1,24 – 4,24	
Single			
Stable union	1	1	<0,01
	0,39	0,24 – 0,64	

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Responsible person's schooling			
< 9 years	1	1	0,01
9 - 12 years	0,48	0,25 – 0,91	
> 12 years	0,44	0,24 – 0,80	
Current occupation of the person responsible for the household			
No occupation	1	1	0,04
Paid work	0,61	0,38 – 0,98	
Total family income in Brazilian minimum wage			
< 1 minimum wage	1	1	<0,01
1 - 2 minimum wages	0,25	0,13 – 0,47	
> 2 minimum wages	0,07	0,03 – 0,16	
Number of residents			
≤ 3 residents	1	1	0,11
≥ 4 residents	1,52	0,90 – 2,58	
Receipt of family allowance			
No			<0,01
Yes	3,84	2,31 – 6,40	
Green basket/basic basket			
No	1	1	<0,01
Yes	4,30	2,03 – 9,10	
Child's birth weight			
≤ 2500grams	1	1	0,07
> 2500 grams	0,54	0,28 – 1,05	
Mothers' nutritional status			
Normal	1	1	0,56
Excess weight	0,87	0,54 – 1,40	
Sewage conditions in the home			
Closed	1	1	0,85
Open	1,12	0,32 – 3,93	
Current smoking			
No	1	1	0,29
Yes	1,47	0,72 – 2,99	
Current alcohol consumption			
No	1	1	0,58
Yes	0,86	0,51 – 1,46	

Source: Prepared by the authors based on survey data.
OR: Odds Ratio; CI 9%: 95% Confidence Interval

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After adjustments, age over 30 ($p < 0.01$) and receiving Bolsa Família aid ($p < 0.01$) remained positively and independently associated with the risk of FI in the household, while having a stable union ($p = 0.02$) and having an income above one Brazilian minimum wage ($p < 0.01$) decreased the chances of risk of FI in the household.

TABELA 2 - Odds Ratio e intervalo de confiança de 95% na análise bruta das variáveis relacionadas com o risco de insegurança alimentar no domicílio em Lavras, MG, Brasil.

Variables	OR	IC 95%	p
Mother's age			
≤ 30 years	1	1	<0,01
30 years	2,50	1,24 – 4,08	
Marital status			
Single	1	1	0,02
Common-law marriage	0,50	0,28 – 0,88	
Total family income in Brazilian minimum wage			
< 1 minimum wage	1	1	<0,01
1 – 2 minimum wages	0,34	0,17 – 0,68	
2 minimum wages	0,11	0,05 – 0,25	
Bolsa Família			
No	19	19,4	<0,01
Yes	79	80,6	

Source: Prepared by the authors based on survey data.
OR: Odds Ratio; CI 9%: 95% Confidence Interval

DISCUSSION

The aim of this study was to analyze the risk of FI in households with children up to 36 months old and its association with the characteristics of those responsible, the household and the child. The prevalence of FI risk in the household was 33.77%. This result was lower than that observed in the same municipality when studying FI in pregnant women [16]. Regardless of the prevalence observed, there is evidence that families at risk of or experiencing FI encounter structural and time constraints that interfere with food choices, meal planning and feeding children [17].

The risk of AI in households with children up to 36 months old can compromise child development. A study conducted to verify child development in two slums found that children living in a family environment with severe FI were less likely to regress from marginal retardation to a normal state when compared to those in food-secure family environments [18]. Public policy actions are needed to prevent households at risk of FI from progressing to severe FI and influencing the growth and development of the children who are part of the family nucleus of the households evaluated in our study.

We found an association between the risk of FI in the household and being over 30 years old, marital status, family income in Brazilian minimum wages and receiving Bolsa Família. The association between age and the risk of FI is poorly documented in the literature. A study conducted in Salvador found that those aged between 30 and 59 had a higher chance of FI [19]. This categorization is similar to the one used in our study, as are the results regarding the risk of FI in the home, which was higher in those aged over 30. On the other hand, there is evidence that in households with residents aged under 18, the proportion of FI is higher, especially when the number of residents in this age group increases [2].

Households in which the interviewee reported being in a stable union were less likely to be at risk of FI. This is to be expected, given that more people are responsible for providing the necessary food for all members of the household, which can be a positive factor in reducing the risk of FI. This result differs from that observed in a city in the interior of Paraná, where marital status was not associated with FI [20]. Despite this contradiction, it is important to note that the lack of a partner results in a

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lack of financial collaboration and, consequently, the existence of only one breadwinner, which can limit resources for the household and affect nutrition.

We found that households that reported an income equal to or greater than one Brazilian minimum wage were less likely to be at risk of FI. This association was also observed when assessing the prevalence of FI in pregnant women [16] and in the city of Salvador [19]. There is evidence that, for Brazilian families, income is one of the main factors in the occurrence of FI [21]. Greater purchasing power seems to be an important factor in reducing the risk of FI. Hunger is a social problem regardless of the availability of food, and is related to limited access due to a lack of resources to acquire it [16].

> “Receiving government aid, such as Bolsa Família, can contribute to better food acquisition; however, in our study, beneficiary families were more likely to live in households at risk of FI.”

One possible explanation for this association is the fact that the data collection took place in a situation of social isolation, during the COVID-19 pandemic. During this period, government benefits were, for many families, the only source of income to meet all the demands of that household, such as food, rent, electricity, health, among others, which may have limited access to food, putting these households at risk of FI.

The findings of this study show that the risk of FI has posed significant challenges for families with children aged 0-36 months, as there is still a need to reduce social inequalities, depending on the associated factors. The newly formulated policies and strategies tend to be implemented gradually, according to the principle of social justice, considering the different Brazilian groups and scenarios and prioritizing the most vulnerable, in order to lead to equitable access to food. Finally, it should be noted that, in the current scenario, decentralized actions, such as intersectoral work, are fundamental to maintaining the reduction in the prevalence of FI in the country, since the characteristics and intensity of the associated factors can vary depending on the context in which the family is inserted.

The strengths of this study include its municipal representativeness, the use of a consistent, validated and objective measure of AI risk, which is analyzed in different parameters, allowing for discussion of this phenomenon. It is important to note that the sample in this study has different perceptions and experiences of AI information, influencing the data obtained. It is also important to consider, when interpreting the results, that the data presented may not reflect the total reality found, since the sample excludes the population without a residential address, which has a high probability of FI.

CONCLUSION

In households with children up to 36 months old, in the municipality of Lavras - MG, it was observed that one third of households had FI. FI was positively associated with being over 30 years old and receiving government aid, while being in a stable union and having a family income of more than one Brazilian minimum wage were negatively associated with the occurrence of FI. Although these results are relevant and can support the development of intersectoral public policies - aimed at reducing socioeconomic inequalities, ensuring food and nutrition security (FNS), promoting health and preventing disease - further studies are needed. It is important to consider, in particular, households with children who do not have a fixed address or are not registered with the Family Health Strategies, for a more comprehensive assessment.

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DECLARATION OF CONFLICT OF FINANCIAL INTEREST AND/OR AFFILIATIONS

There is no conflict of interest to report.

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