The state of child food security in Brazil between 2016 and 2024: a systematic review

Luiza Caixeta Piazza [a]

[a] Public Policy and Management Undergraduate Student, School of Arts, Sciences and Humanities, University of Sao Paulo, Sao Paulo, Brazil, luiza.piazza@usp.br.

Abstract. Background: The right to access adequate food has been recognized worldwide since the beginning of the 20th century as a human right. In Brazil, food and nutrition policies have existed for decades but were strengthened with the creation of a public universal healthcare system in the 1980s. Food security is especially important during childhood since it is a period of accelerated development of the brain and body, demanding for nurturing care and nutrition. **Objectives:** the aim of this study is to verify how food security in childhood (from 0 to 12 years) is being analyzed in Brazil. **Methodology:** A systematic review was conducted to assess the state of the art of research analyzing children food security in Brazil, using the databases Web of Science and Scientific Electronic Library Online (SciELO). **Results:** Twelve articles published between 2016 and 2024 were analyzed and categorized into four main groups of findings, related to children eating habits, child development and health, social and economic context and the sources of data used. **Conclusion:** It was found that childhood food security is associated with high rates of consumption of ultra-processed foods, low consumption of natural foods, health problems and delays in child development, and poverty. Further studies may analyze the food security status of children between 5 and 12 years old, the longitudinal behavior of child food security and contemporary challenges in child behavior, such as exposure to child food advertising and the use of social media.

Keywords. Food security, Infant Food Security, Childhood, Brazilian Children, Systematic Review

1. Introduction

The right to access adequate food has been recognized as a human right. It is briefly stated in article 25 of the Universal Declaration of Human Rights of 1948 and is further elaborated in Article 11 of the International Covenant on Economic, Social and Cultural Rights of 1966, which addresses the equitable distribution of food around the world. The recognition of a human right means states have the obligation to implement policies to monitor and ensure their population's access to adequate food [1]. The promotion of this right is directly associated with the concept of food and nutrition security, which was coined at the World Food Summit in Rome in 1996. Food security refers to access to food in the quantity and quality necessary for a healthy life, while food insecurity occurs when access to food is interrupted or unstable and the health and lives of individuals are threatened [2].

In Brazil, food and nutrition policies date back to the 20th century, when important programs emerged, such as the School Meal Campaign, created in 1955 and currently named National School Feeding Program (PNAE), and the Workers' Food Program, created in 1976. These programs, however, were marked by discontinuity and fragmentation. Also, they were normally limited to certain groups, such as students in the public education system and formal workers, in the examples cited, respectively. It is therefore considered that food and nutrition policies were consolidated with the creation, in 1988, of the Unified Health System (SUS), the public and universal system of access to free healthcare in the country, and the approval, in 2006, of the Organic Law of Food and Nutrition Security (Losan) [3].

One of the responsibilities of the health system is to carry out health surveillance and provide dietary guidance in order to ensure compliance with the social right to health as guaranteed by Article 196 of the 1988 Federal Constitution, which includes the guarantee of food and nutritional security. In addition to this, Losan was approved in 2006, which institutionalized the National System of Food and

Nutrition Security, which facilitated the articulation of health promotion, social protection and agricultural production policies in order to fight food insecurity. The strengthening of these policies allowed the country to make progress in the fight against hunger and poverty, driving the emergence of new facets of food insecurity, such as obesity and the consumption of ultra-processed foods (highly industrialized foods that mainly use artificial ingredients).

One of the challenges for food and nutrition policies is how to measure food security appropriately. Over the years, various measures have been used, such as household income, an approximation of the ability to purchase food, the amount of calories available and/or consumed in a given period, or anthropometric measures, such as weight and height [4]. Although no indicator is complete enough to cover all dimensions – economic, social, environmental, political, and household – of food security, multidimensional methodologies and indicators have been developed in attempt to measure it. One of the best known is the Cornell Indicator, developed in the United States, which conceptualized hunger in a qualitative way based on group discussions of people who have already experienced it. The Cornell Indicator was adapted to the Brazilian context, giving rise to the Brazilian Food Insecurity Scale (EBIA), which quantifies the perception of individuals in a family/household regarding their access to food [5]. The EBIA scale stands out in Brazil, as it is used in one of the country's main population studies, the PNAD (National Household Sample Survey), which researches general characteristics of the population in nationwide samples.

Food security and access to adequate food are especially important during childhood: it is estimated that around 90% of the connections made by the brain occur before the age of six, a period known as “early childhood” [6], which is the period of most accelerated development of the body and brain throughout life. This means that early childhood is a crucial phase in determining the chances of having a healthy life and development, which requires, amongst other factors, access to adequate food and nutrition.

In Brazil, food is one of the rights of children that must be ensured with absolute priority by the State, families and society, according to the Federal Constitution of 1988 (article 227) [7] and the Statute of Children and Adolescents (Law No. 8,069, of July 13, 1990) [8]. In addition, the Legal Framework for Early Childhood (Law No. 13,257, of March 8, 2016) defines, in its article 5, that food and nutrition are one of the priority areas for public policies for early childhood [9]. The National Policy for Comprehensive Child Health Care (PNAISC), established by Ministry of Health Ordinance No. 1,130, of August 5, 2015, establishes as one of its strategic axes breastfeeding and healthy complementary feeding, which unfolds into a series of health policies aimed at promoting breastfeeding and the establishment of healthy eating habits among pregnant women and children [10].

In this context, the goal of this study is to verify, through a literature review, how food security in childhood is being analyzed in Brazil, assessing which indicators are used and which factors are associated with the food (in)security situation of children. Children are considered to be people aged 0 to 12 years, according to Brazilian legislation [8].

2. Methodology

A systematic review was conducted to assess the state of the art of research analyzing children food security in Brazil. Systematic reviews consist in the process of finding, reading, categorizing, summarizing and comparing academic work in a certain field of studies [11].

The databases used for finding the articles for the review were *Web of Science* and *Scientific Electronic Library Online (SciELO)*, a Brazilian platform. The keywords used in search engines were “food security”, “children” and “Brazil”. The keywords “food insecurity”, “childhood” and “infant” were also used, however they did not lead to different results.

Results were filtered to include works from the past 10 years (after 2015) and to exclude fields of study which are not relevant for this review, such as agriculture and environmental sciences. Other exclusion criteria were articles that did not focus on children, articles that address food security in non-urban areas and articles that analyzed the impacts of specific food security policies instead of the state of food security in general.

3. Results

After establishing and applying criteria for inclusion and exclusion, 12 articles were selected as relevant for this study. The selected articles range from 2016 to 2024, although most of them (92%) were published after 2020. Half of the studies selected come from the field of Nutrition, followed by studies that combine Nutrition and Public Health (25%), Public Health (17%) and one that combines Medicine and Public Health. Vast majority of studies (84%) were cross-sectional and only two were panel studies. Most studies (59%) used the EBIA scale as a measurement of food security in the child household. Beyond the tendency to use the EBIA scale, three main tendencies were identified in the studies selected, as will be discussed in the following section.

4. Discussion

4.1 Eating habits

The aspect that appears most frequently in the selected studies is the relationship between childhood food (in)security and certain eating habits and the consumption of some food groups. In general, the state of food insecurity is associated with

high levels of consumption of ultra-processed foods and low intake of natural foods.

A study conducted between 2017 and 2018 with approximately 500 children under 2 years of age in the Federal District identified high consumption of ultra-processed foods, combined with high consumption of sugar, sodium, and saturated fat, negatively affecting the quality of the diet [12]. The prevalence of consumption of ultra-processed foods was associated with food insecurity in a large study that analyzed more than 12,000 children under five years of age throughout Brazil [13]. Consumption of ultra-processed food was also seen as generalized in a study that analyzed the diet of approximately 4,000 children under 2 years of age in the country, being associated with a low diversity of foods consumed, especially among poorer children [14]. Another study, published in 2021, analyzed food consumption in households with and without children and adolescents in Campinas [15]. Although it did not find an association between eating habits and child food security, it highlighted that, in households with children and adolescents, soft drinks consumption is higher than average. A study published in 2023 analyzed the consumption of fruits and vegetables by 44 children up to 4 years old in public schools in the city of São Paulo and found that the consumption of these foods is lower in households facing food insecurity, which may be associated with factors such as income availability and parental education [16]. The results of these studies are particularly worrying since eating habits early in life are decisive for the development of personal tastes and food preferences [12].

4.2 Child development and health

In addition to the formation of personal taste and eating habits, the excessive consumption of processed and sugary foods, as well as the low variety of healthy foods during childhood, causes concern in terms of child development and health, according to a second group of studies identified in this review.

Three of the studies analyzed indicate that food insecurity in childhood is associated with worse health conditions and delays in psychomotor development. A study that analyzed 1,000 children under 2 years of age in the Federal District found an association between food insecurity and delays in child development, measured by the Denver Developmental Screening Test II, indicating that policies for access to food in childhood are crucial drivers of human development [17]. A similar result was found when studying the food security status of mothers and infants in the city of Pelotas, which found, using the Bayley Scale of Infant and Toddler Development, an association between food security in infants under 18 months and better motor and socio-emotional development [18]. It is noteworthy that this study was longitudinal, indicating how these conclusions are sustained over time, reinforcing the importance of ensuring food security throughout childhood. Finally, a study of approximately 4,000 Brazilian children under the age of 5 found that, in households with food insecurity, there was a higher prevalence of malnourished children and children with health problems such as pneumonia and diarrhea, which are especially serious at this stage of life [19]. In addition to the impacts on children, this study draws attention to the effects of food insecurity on the production of productive human capital, which can influence the maintenance of an intergenerational cycle of poverty, worsening the situation of poverty and food insecurity in the long term.

4.3 Social and economic context

The issue of poverty has appeared in several other studies, relating child food security and the impact of the socioeconomic context in which the child and their family live.

The previously mentioned study that identified higher consumption of soft drinks in households with children and adolescents [15] also associated the presence of children and adolescents with a greater share of the family budget spent on food purchases, indicating that poverty reduction policies and increased family income are necessary to guarantee food security, especially to provide higher quality food. A similar conclusion was reached by a study conducted in 2017 in São José dos Pinhais, in which approximately 400 mothers and children up to 35 months participated, that identified higher rates of food insecurity in households with lower incomes [20]. At the municipal level, a longitudinal study identified that breastfeeding and complementary feeding practices vary between different cities, depending on the context. In municipalities with lower poverty rates, there is less deprivation in access to adequate and healthy food, which, in turn, is reflected in better indicators of child nutrition and health. Thus, actions specifically aimed at poorer municipalities have the potential to be more efficient in combating child food insecurity [21].

However, it is important to highlight that policies to combat poverty alone are not necessarily capable of ensuring food security. A study carried out in the city of João Pessoa identified a higher prevalence of food insecurity among families with low levels of education and families receiving Bolsa Família, the largest cash transfer program in Brazil, indicating the need to strengthen the program and associate it with other policies and factors so that it can be effective in combating hunger in certain contexts [22]. In the same vein, a study carried out in Maceió in 2019 analyzed the impact of social networks (contact networks and social support connections) on the nutritional status of poor children and found that increasing a child's social network reduces the likelihood that they will suffer from food insecurity. Despite its limitations, such as a small sample size (N=92), the study suggests new ways to reflect on combating food insecurity, going beyond more classic factors such as income and parents' education [23].

4.4 Data sources

Throughout the studies analyzed, the prevalence of the use of the Brazilian Food Insecurity Scale (EBIA) as a measure of the state of food security was verified. One of the studies that used alternative measurements used a similar method [12], the "24-h recall", which consists of asking respondents about their food and beverage consumption in the 24 hours prior to the survey. Three other studies used data from national surveys carried out in previous years: the National Survey of Demographics and Health of Children and Women, which was carried out in 2006 by the Ministry of Health to verify the profile of children up to 5 years old and women of childbearing age in the country [19] and the Brazilian National Survey on Child Nutrition (ENANI), the first national population survey on dietary practices, including breastfeeding, nutritional status and anthropometric measurements of children under 5 years old, which was carried out in 2019 by the Federal University of Rio de Janeiro [13] [14]. Finally, a single study used data on children under 2 years old obtained from the Food and Nutrition Surveillance System (SISVAN), which gathers data on the diet of all people who access primary health services of the Brazilian public health system, SUS [21].

The use of EBIA is facilitated, as it is a questionnaire that can be applied in different contexts, enabling the collection of primary data specific to the context one seeks to understand. The underuse of health survey data may be related to the lack of data updates, since the last ENANI was carried out in 2019 and the consolidated data from ENANI-2024 have not yet been published [24]. The use of SISVAN data still has potential for expansion, which is reflected in the expansion of the use of the system itself by health professionals in the country, since the coverage and quality of the data is not yet complete but has been strengthening in recent years [25]. SISVAN is an interesting source of data, since it is a universal system, with coverage throughout the country.

5. Conclusion

Twelve articles published between 2016 and 2024 were analyzed to determine how food security in childhood is being studied in Brazil. It was found that the Brazilian Food Insecurity Scale is the most widely used assessment method to measure the perception of individuals and families about their food security status, and most studies are carried out by nutritionists and health professionals. It was also found that childhood food security is associated with high rates of consumption of ultra-processed foods and low consumption of natural foods. In addition, food insecurity is associated with factors related to the child's economic and social context, and combating poverty is essential, although not sufficient, to combat food insecurity. Finally, it was found that food insecurity in childhood is associated with health problems and delays in child development, which can have long-term impacts on the child's life and on society in general. It is also possible to note some gaps and possibilities for further elaboration. For example, most studies focus on children up to about 5 years old, leaving a gap in understanding the food security status of children between 5 and 12 years old. In addition, few studies have a longitudinal approach, making it difficult to understand how food security, its determinants and consequences behave over the years in childhood. Finally, no studies were found with empirical data on the association between child food security and important contemporary challenges in child behavior, such as exposure to child food advertising [26] and the use of social media [27]. Thus, although Brazilian child food security is a topic widely explored in the literature in recent years, there is still the possibility of further exploring new data and associations.

6. References

[1] Cervato-Mancuso A. M., Watanabe H. A. W., Bógus C. M. Direito Humano à Alimentação Adequada: refletir e agir para promover. In: Barbosa F. C., editor. *Nutrição em foco: uma abordagem holística.* 4 ed. Vol. 1. Editora Conhecimento Livre, Piracanjuba; 2019; p. 31-43.

[2] Anthem P. Food security – what it means and why it matters [Internet]. Rome: World Food Programme: 2025 [cited 13 Apr 25]. Available from: https://www.wfp.org/stories/food-security-what-it-means-and-why-it-matters.

[3] Jaime, P. C. Políticas Públicas de Alimentação e Nutrição. Atheneu, Rio de Janeiro; 2019; 256 p.

[4] Kepple, A. W., Segall-Corrêa A. M. Conceituando e medindo segurança alimentar e nutricional. *Ciência & Saúde Coletiva.* 2011;16(1):187-199.

[5] Sardinha, L. M. V., editor. Estudo Técnico No. 01. *Escala Brasileira de Insegurança Alimentar – EBIA: análise psicométrica de uma dimensão da Segurança Alimentar e Nutricional.* Estudos Técnicos SAGI, Brasília; 2014; 15 p.

[6] Fundação Maria Cecilia Souto Vidigal, editor. Os primeiros anos em suas mãos. 2024; 40 p. Available from: https://biblioteca.fmcsv.org.br/biblioteca/primeiros-anos-suas-maos.

[7] Constituição da República Federativa do Brasil de 1988 [Internet]. Brasília: Presidência da República [cited 13 Apr 2025]. Available from: https://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm.

[8] Lei Nº 8.069, de 13 de julho de 1990. [Internet]. Brasília: Presidência da República [cited 13 Apr 2025]. Available from: https://www.planalto.gov.br/ccivil_03/leis/l8069.htm.

[9] Lei Nº 13.257, de 8 de março de 2016. [Internet]. Brasília: Presidência da República [cited 13 Apr 2025]. Available from: https://www.planalto.gov.br/ccivil_03/_ato201

5-2018/2016/lei/l13257.htm.

[10] Portaria Nº 1.130, de 5 de agosto de 2015. [Internet]. Brasília: Ministério da Saúde [cited 13 Apr 2025]. Available from: https://bvsms.saude.gov.br/bvs/saudelegis/gm/2015/prt1130_05_08_2015.html.

[11] Silva V. F. O que dizem as avaliações de impacto das Unidades de Polícia Pacificadora (UPPs)? *Revista Brasileira de Informação Bibliográfica em Ciências Sociais.* 2018;85(1):56-76.

[12] Spaniol A. M., Costa T. H. M., Souza A. M., Gubert M. B. Early consumption of ultra-processed foods among children under 2 years old in Brazil. *Public Health Nutrition.* 2020;24(11),3341–3351.

[13] Carneiro L. B. V., Lacerda E. M. A., Oliveira N., Schincaglia R. M., Alves-Santos N. H., Berti T. L., Crispim S. P., Farias D. R., Mello J. V. C., Normando P., Castro I. R. R., Kac G. Food poverty among children aged 6–59 months in Brazil: results from the Brazilian National Survey on Child Nutrition (ENANI-2019). *Public Health Nutrition.* 2023:27(e162),1–10.

[14] Lacerda E. M. A., Bertoni N., Alves-Santos N. H., Carneiro L. B. V., Schincaglia R. M., Boccolini C. S., Castro I. R. R., Anjos L. A., Berti T. L., Kac G. Brazilian Consortium on Child Nutrition. Minimum dietary diversity and consumption of ultra-processed foods among Brazilian children 6-23 months of age. *Reports in Public Health.* 2023;39(2),1-17.

[15] Souza B. F. N. J., Camargo D. F. M., Segall-Corrêa A. M., Marín-León L., Francisco P. M. S. B. Food insecurity, food expenses and consumption of sugar and soft drinks in households with and without children and/or adolescents. *Revista de Nutrição.* 2021;34,1-11.

[16] Segui E. M., Castro A. G. P., Silva J. T. S., Collese T. S. Segurança alimentar e consumo de frutas e vegetais entre pré- escolares: estudo exploratório durante a pandemia da COVID-19. *O Mundo da Saúde.* 2023;47.

[17] Oliveira K. HD., Buccini G., Hernandez D. C., Pérez-Escamilla R., Gubert M. B. Household food insecurity and early childhood development in Brazil: an analysis of children under 2 years of age. *Public Health Nutrition.* 2021;24(11),3286–3293.

[18] Ávila C. N., Trettim J. P., Rubin B. B., Scholl C. C., Coelho F. T., Matos M. B., Motta J. V. S., Pinheiro R. T., Quevedo L. A. Association between food insecurity and infant development at age 18 months in the urban area of Pelotas, Rio Grande do Sul State, Brazil. *Reports in Public Health.* 2024; 40(12),1-11.

[19] Poblacion A., Cook J. T., Marín-León L., Segall-Corrêa A. M., Silveira J. A. C., Konstantyner T., Taddei J. A. A. C. Food Insecurity and the Negative Impact on Brazilian Children's Health—Why Does Food Security Matter for Our Future Prosperity? Brazilian National Survey (PNDS 2006/07). *Food and Nutrition Bulletin.* 2016; 37(4),585-598.

[20] Chapanski V. R., Costa M. D., Fraiz G. M., Höfelmann D. A., Fraiz F. C. Food insecurity and sociodemographic factors in children in São José dos Pinhais, Paraná, Brazil, 2017: cross-sectional study. *Epidemiol. Serv. Saude.* 2021;30(4),1-13.

[21] Souza G. R., Ribeiro-Silva R. C., Felisbino-Mendes M. S., Silva N. J., Andrade R. C. S., Pedroso J., Spaniol A. M., Bortolini G. A., Nilson E. A. F., Silva S. A., Lourenço B. H., Rocha A. S., Falcão I. R., Ichihara M. Y. T., Farias D. R., Barreto M. L. Time trends and social inequalities in infant and young child feeding practices: national estimates from Brazil's Food and Nutrition Surveillance System, 2008–2019. *Public Health Nutrition.* 2023;26(9), 1731–1742.

[22] Pedraza D. F. Food and nutrition insecurity among families with children under five years of age in the Metropolitan Region of João Pessoa, Paraíba, Brazil. *Ciência & Saúde Coletiva.* 2021; 26(4),1511-1520.

[23] Barros L. K. N., Clemente A. P. G., Bueno N. B., Silva-Neto L. G. R., Pureza I. R. O. M., Britto R. P. A., Santos M. R. C., Florêncio T. M. M. T. Rede social de crianças desnutridas e sua relação com a segurança alimentar e nutricional da família. *Rev. Bras. Saúde Mater. Infant.* 2022;22(4),1007-1014.

[24] Estudo Nacional de Alimentação e Nutrição Infantil. ENANI 2024 [Internet]. Rio de Janeiro: ENANI: 2024 [cited 13 Apr 25]. Available from: https://enani.estudiomassa.com.br/enani-2024/.

[25] Araújo W. Qualifica Sisvan: estudo identifica melhora significativa na qualidade dos dados das crianças menores de cinco anos [Internet]. Salvador: Centro de Integração de Dados e Conhecimentos para Saúde – CIDACS: 2023 [cited 13 Apr 25]. Available from: https://cidacs.bahia.fiocruz.br/2023/09/27/qualifica-sisvan-estudo-identificou-melhora-significativa-na-qualidade-dos-dados-das-criancas-menores-de-cinco-anos-entre-os-anos-de-2008-a-2017/.

[26] Bortoletto A. P., Karageorgiadis E. Publicidade infantil: a porta de entrada para produtos ultraprocessados [Internet]. Brasília: Observatório Brasileiro de Hábitos Alimentares [cited 13 Apr 25]. Available from: https://obha.fiocruz.br/?p=463.

[27] Martins A. M., Farinazzi-Machado F. M. V., The Influence of social media on child food consumption. *Research, Society and Development.* 2022;11(14),1-7.