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REVIEW ARTICLE

Social vulnerability among Brazilian children in early childhood: a scoping review

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Abstract
Objective: To identify, map, and describe studies involving Brazilian children in early childhood in situations of social vulnerability.
Source of data: A scoping review including full articles published in Portuguese and English up to March 2023, with no temporal restrictions. Searches were conducted in the MEDLINE/PubMed, Scielo, EMBASE, Cochrane, Scopus, CINAHL, Web of Science, PEDro, and LILACS databases. Journal metrics, sample characteristics, study area, characterization of the situation of social vulnerability, and study outcomes were extracted.
Summary of the findings: Seventy-six articles involving a total of 107.740 children in early childhood were included in this study. These studies presented relevant findings, including the temporal publication trend, the variability of social vulnerability indicators, the scarcity of intervention studies, and the fact that 100% of eligible studies were from the health area. Negative outcomes were associated with the condition of social vulnerability in almost the entire sample, reinforcing the need for government policies capable of protecting early childhood from the effects of social vulnerability.
Conclusion: This scoping review mapped important findings involving Brazilian children in social vulnerability. It also identified literature gaps such as the need for intervention and multisectoral studies among health, education, and social protection.
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Introduction

Early childhood, from birth to six years of age, has been the subject of study and the focus of attention in various institutions in Brazil and worldwide in recent years. The increased

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interest in conducting studies directed at the first six years of life is motivated by the fact that this is a sensitive period of brain development, considered a window of opportunities for the individual's full development.[1] This period requires special attention because there is greater potential for the development of cognitive, affective, and socio-emotional skills, considered as the foundation for later stages of development.[2]

The Brazilian population in the 0−6 age group is estimated at 19 million, representing 8.91% of the country's 211 million inhabitants.[3] Among these, there is a portion living in poverty and extreme poverty. The Institute of Applied Economic Research (IPEA) pointed out another alarming data, that there was an increase of over one million people living in poverty in Brazil as a consequence of the COVID-19 pandemic.[4] In addition to this statistic, a warning about the situation of childhood in the country is the statement by experts that children are disproportionately represented in the population indices affected by poverty. That is, the number of children is much higher than that of adults in situations of social vulnerability due to the context of poverty or extreme poverty to which they are exposed.[5]

The concept of social vulnerability presents variations depending on the study area in Brazil, demonstrating that there is no single or consensual definition of this term in the country.[6-8] Vulnerability is characterized by a set of individual or collective factors that make individuals or communities more susceptible to illnesses or harms, associated with a lack of resources capable of providing protection.[9] The United Nations International Children's Emergency Fund (UNICEF), in turn, uses the term multidimensional poverty to express a situation that goes beyond the lack of financial resources but is related to deprivations, exclusions, and vulnerabilities to which children are exposed.[9] Eight indicators are evaluated in this poverty definition: food, education, income, sanitation, water, protection against child labor, housing, and information.[9]

For this study, the authors adopted the understanding of the National Social Protection Policy (PNAS), whose conception takes into account various factors beyond poverty or lack of financial resources.[10] It defines that basic social protection should serve the population that is socially vulnerable due to factors such as poverty, lack of income, lack of access, or precarious access to public services. People with weakened social and affective bonds or who are subjected to discrimination based on gender, race, physical, mental, or intellectual disabilities, among other adverse situations.[10]

Children in social vulnerability are more exposed to adverse experiences, such as food insecurity, neglect in care, malnutrition, and violence. Such experiences tend to harm child development in all its domains: cognitive/language, affective-social, and motor.[11] Anemia in infants due to iron deficiency poses a risk to short- and long-term development even when they undergo iron replacement therapy.[11,12] There is evidence that malnutrition continues to be a serious public health problem that affects developing countries, being responsible, even in this century, for alarming mortality rates of children under five years of age around the world.[13,14] Millions of children in early childhood living in developing countries are unable to reach their development potential due to a lack of access to health, nutrition,

safety, protection, responsive care, and appropriate learning materials.[15] Comprehensive studies involving underdeveloped and developing countries on different continents have been carried out with the aim of demonstrating how necessary care is in this age group, combating the effects of poverty and other risk factors on child development.[7,12,13]

The 1988 Federal Constitution grants Brazilian children the status of rights holders, as determined in its article 277: "It is the duty of the family, society, and the State to ensure, with absolute priority, the rights of children and adolescents to life, health, [...], as well as to protect them from all forms of negligence, discrimination, exploitation, violence, cruelty, and oppression".[16] Since then, important steps have been taken to guarantee the rights of children, such as the Statute of the Child and Adolescent; the ratification, by Brazil, in September 1990, of the Convention on the Rights of the Child; and the approval, in 2010, of the National Plan for Early Childhood, the Legal Framework for Early Childhood, among others.[17,18]

It is known that an intersectoral effort involving health, education, and social protection is necessary to reach this audience effectively and efficiently.[19,20] It can be observed that in Brazil, a legal framework has been produced to guarantee the protection of its children, as well as the implementation, over the past 30 years, of public policies aimed at consolidating this protection. However, there are questions about the practical results of these efforts: Do the studies produced in this area reveal what the country has achieved or done in terms of health, well-being, and the development of early childhood in situations of social vulnerability? What has been studied and published based on what is being done for the health, well-being, and development of early childhood in social vulnerability in Brazil? What are the outcomes of studies involving Brazilian children in early childhood in social vulnerability?

The authors consider it of fundamental importance to highlight what is documented in the literature regarding Brazilian children in early childhood in situations of social vulnerability. Therefore, the authors chose the literature review method by Scoping Review for this study. This type of research is suitable for answering broad questions and mapping the literature in a specific area of knowledge.[21]

Methods

A Scoping Review was conducted following the methodological recommendations of the Joanna Briggs Institute (JBI) and the items of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist- extension for scoping reviews.[22] This method has well-defined criteria, and its main indication is to map scientific production by area of knowledge. It is capable of answering broad questions, identifying gaps in certain fields, synthesizing results, and making recommendations for new studies. The protocol for this Scoping Review prepared as provided in the JBI and PRISMA checklist, is registered on the Open Science Framework (OSF) platform DOI: 10.17605/OSF.IO/CU69Q.

Considering that this study involves Brazilian children, the authors chose to use the concept of early childhood defined and utilized in Brazil, which is the period characterized by the age range from zero to six years.[1,3] Regarding

the definition of social vulnerability, the authors used the one provided by the PNAS.[10]

Search strategy

To structure the search strategy, the main question was adapted to the PCC mnemonic (P: Population; C: Concept; C: Context); corresponding respectively to Brazilian children, early childhood, and social vulnerability. Searches for eligible studies were conducted in the MEDLINE/PubMed, Scielo, EMBASE, Cochrane, Scopus, CINAHL, Web of Science, PEDro, and LILACS databases from August 8th to 14th, 2022, with an update in April 2023. There were no searches in the grey literature. Adjustments to the search strategy were made according to the specificities of each database, maintaining a similar combination of descriptors as stated in the registered protocol and Supplementary file 1.

Eligibility criteria

Quantitative, cross-sectional, and longitudinal observational (descriptive and exploratory) and experimental studies of different methodological designs involving Brazilian children in early childhood (0 to 6 years old) in situations of social vulnerability were included. Only full articles published in Portuguese and/or English were considered. Studies without social vulnerability criteria, those involving foreign children, qualitative studies, studies on infant mortality, maternal care, letters, editorials, reviews, and those available only in abstract format were excluded.

Study selection and data extraction

The study selection occurred in four stages: identification of articles in the databases, exclusion of duplicates using the Mendeley reference manager, reading titles and abstracts, and finally, reading the full texts with data stratification. The screening of studies was independently conducted by two reviewers (AMB and DOS). In cases of disagreement, a third reviewer (RLSM) was involved to decide on the inclusion or exclusion of some studies.

For data extraction, a form was developed and tested on the first five studies to assess its coherence with the research objective. Data extraction included: (1) study characteristics (authors, year of publication, title, language of publication, study type, study objectives, Brazilian regions, proponent institution, and access link); (2) journal metrics (journal title, impact factor, and indexing source); (3) sample characteristics (sample size and age range); (4) study area (grouped into 04 major health areas: Nutrition, Development, Health conditions, and Dentistry); (5) characterization of the situation of social vulnerability; and (6) outcomes presented in the study. For the analysis of journal impact factors, the Journal Citation Report (JCR) classification was considered.

Results

Through searches conducted in the databases, 3162 studies were identified, with 1014 duplicate publications removed. After screening by title and abstract, 2039 studies were excluded, and 109 full texts were evaluated, resulting in 31 exclusions: 2 studies were not retrieved for full reading, and 29 did not meet the eligibility criteria. Thus, 76 articles were included for data extraction.[23-98] Supplementary file 2 illustrates the study selection process.

Table 1 presents the general characteristics of the studies. The first publication included in this scoping review dates back to 1984.[23] A substantial increase in research involving early childhood social vulnerability is observed from the year 2000 until March 2023. During this period, 92.11% of the sample in this review was published,[26-55,58-98] with only 7.89% of publications from 1984 to 1999.[23-26,55,56] In the comparison between regions of the country, the Northeast region conducted the highest quantity of research,[26,44,45,48,49,52,54,56-59,65,68-70,74,76,77,79,82,83,85-87,92,95,96] followed by the Southeast region.[23,29-31,39,47,60,61,64,66,67,72,73,80,81,84,91,92,97] Additionally, many studies are multicentric or have a national scope.[27,34,42,43,35,38,40,41,46,53,63,68,82] No specific studies from the Central-West region were included. Federal public education institutions were responsible for over 70% of the studies,[23,25,28,30-43,45-52,59,61-65,67,70,71,74,76-78,80-83,85,88-90,93,96,97] followed by state public institutions,[27,29,44,54,60,66,72,73,84,87,91] together accounting for more than 85% of the total sample. Foreign institutions[26,56-58,92,79,86] represented a higher percentage of publications than private institutions[29,51,53,94] in the country. Regarding language, English publications were prevalent, representing more than two-thirds of the total sample,[23,24,26,28,31-33,35,37,38,40-42,44,45,47-50,52,55-61,63-70,72-77,79,81,83-86,88-93,95,98] followed by publications in Portuguese.[27,33,34,39,41,43,51,54,62,78,82,87,96]

Table 1 General characteristics of the included studies.

Characteristics	n (%)
DECADE OF PUBLICATION	
1980−1989	2 (2.63)
1990−1999	4 (5.26)
2000−2009	12 (15.79)
2010−2019	37 (48.69)
2020−2023*	21 (27.63)
BRAZILIAN REGION	
North	01 (1.32)
South	12 (15.79)
Southeast	19 (25.00)
Northeast	30 (39.77)
Midwest	0 (0.0)
Multicentric studies (various regions)	14 (18.42)
LANGUAGE	
English	58 (76.31)
Portuguese	12 (15.79)
English/Portuguese	6 (7.90)
PROPOSING INSTITUTIONS	
Public Federal Institutions	54 (71.05)
Public State Institutions	11 (14.47)
Private Institutions	4 (5.26)
Foreign Institutions	7 (9.22)
TOTAL	**76 (100)**

* Months from January to March.

In Table 2, the authors present the specific characteristics of the studies and the quality of the journals. A significant percentage of studies were cross-sectional and observational/exploratory in nature[26,33,54] unlike experimental studies, which represented less than 3% of the sample.[76] Regarding the quality and relevance of the journals, over 80% of the studies were published in journals with an impact factor[23-26,32] with more than two-thirds of these having an impact factor above 2. All eligible studies are in the Health field and were classified into four major sub-areas: Nutrition[23-55] Health conditions,[56-69] development (socio-affective, cognitive/language, and motor),[70-82] and Dentistry.[91-97] It is essential to note that although classified in this way, researchers come from various fields, including medicine, nursing, nutrition, physiotherapy, psychology, biology, physical education, and biomedicine, among others.[83-90] It was observed that the majority of studies are in the field of Nutrition,[23-55] a small part in Dentistry[91-97] followed by those inter/multi-areas, meaning the investigated outcomes covered two or more health areas.[83-90] In Table 3, the authors present a synthesis of the main characteristics of social vulnerability, the main outcomes, and sample size by area of study. They were divided into four major areas: Nutrition, Health conditions, Development, and Dentistry. Studies that covered more than one area, i.e., inter/multi-areas, were exposed in this table, individually identifying each involved area. There is a more detailed breakdown of the extracted results in Supplementary materials 3 and 4.

In Figure 1, the detailed and percentage-based presentation of how vulnerability indicators were reported in the studies is shown. In many studies, more than one indicator was used to define the situation of social vulnerability, and therefore, the sum of the percentages expressed in the figure exceeds 100. There were cases where a composite index was created from various indicators.[47,67,70,81] Education and income, both family and per capita, were the most commonly used indicators.[24,25,28,30,31,41-43,46-50,54,59,60,62,71,75,90,92,97] Education, in most cases, referred to mothers, as did occupation.[30,32,35,36,37,40,43,44,51,62,72,79,82,91,96] Household characteristics, such as the type of material used in its construction, the number of rooms, internal bathroom, independent kitchen, and services such as sanitation, treated water, and garbage collection, were also explored in the studies.[28,31,32,35,44,47,51,52,53,56,57,59,65,71,72,78] Some studies only indicated the type of population, such as indigenous, *quilombola*, slum resident, or rural settlement resident, as a defining factor for socially vulnerable conditions.[37,58,61,64,68,74,83,85,86] The least mentioned indicators, exposed in Figure 1 as "other indicators," included internet use,[53] landline telephone,[59] electricity,[72] home-ownership,[24] mode of transportation, local violence,[78] literacy rate for those over 20 years old,[46] region of residence (North, South, Southeast, Northeast, Midwest), Gini index [93] and food insecurity.[29,45,46,62,63,90]

In Figure 2, a detailed breakdown of outcomes found by area is presented, considering the percentage within each area. It is important to note that a study in a particular area may have analyzed different outcomes. In Nutrition studies, anthropometric measurements are primarily evaluated to diagnose nutritional status,[23-26,29,32,34,48,83,86-89] followed by dietary practices to assess diet quality and nutritional guidance, as well as breastfeeding and the presence of vitamins, amino acids, and minerals.[26,31,32,37,38,45] Health conditions studies mainly assessed infectious diseases such as diarrhea, parasitic infections, pneumonia, COVID-19, tuberculosis, and the presence of Helicobacter pylori.[41,56,57,59,61,63,64,66,67,88] These were followed by factors presented in the neonatal period such as low birth weight and health conditions during this period[58,60,62,68,69,83,98] Some research[65,89] also focused on non-infectious-diseases typical of this period, such as asthma. Studies involving Dentistry particularly evaluated the presence or prevention of dental caries,[84,89,91-97] followed by trauma and defects in tooth enamel.[83] In the Development area, the evaluation primarily involved cognitive or language development,[70,71,73-75,77,79-82] followed by motor development (gross and/or fine) and socio-emotional development.[71,75-77,79,82]

Discussion

The 76 included studies presented relevant findings, including the temporal trajectory of eligible study publications, the variability of social vulnerability indicators, the association between vulnerability indicators and negative outcomes in early childhood, the scarcity of intervention studies, and the fact that 100% of eligible studies were in the field of Health.

In conducting searches across major databases without any temporal restrictions, the authors sought to expose how the Brazilian State has been involved with childhood issues throughout history and to determine how important guidelines are to maximize child health outcomes.[99] The first eligible article meeting the inclusion criteria for this review was identified only in 1984, nearing the end of the 20th

Table 2 Specific characteristics of studies and quality of Journals.

CHARACTERISTICS	n (%)
STUDY TYPE	
Observational/Exploratory Cross-Sectional	43 (56.57)
Descriptive Cross-Sectional	17 (22.37)
Exploratory Longitudinal	12 (15.79)
Randomized Clinical Trial	2 (2.63)
Quasi-Experimental	1 (1.32)
Descriptive Longitudinal	1 (1.32)
STUDY AREA	
Nutrition	33 (43.42)
Health conditions	14 (18.42)
Development	13 (17.11)
Multi-Area	9 (11.84)
Dentistry	7 (9.21)
IMPACT FACTOR	
≥ 6	6 (7.89)
2 to 6	42 (55.27)
≤ 2	13 (17.10)
Without Impact Factor	15 (19.74)
TOTAL	**76 (100)**

Table 3 Summary of the main characteristics of social vulnerability and outcomes presented in the studies.

Study area and total sample number	Identification of studies 1st author and year of publication	Characterization of social vulnerability	Main outcomes presented in the studies
NUTRITION (n = 51.492)	Donangelo (1984);[23] Victora et al. (1986);[24] Post (1999);[25] Souza et al. (1999);[26] Silva et al. (2000);[27] Post (2000)[28] Nogueira et al. (2001);[29] Oliveira et al. (2010);[30] Domene et al. (2011);[31] Ferreira et al. (2013);[32] Ferreira et al. (2013);[33] Santos (2013);[34] Leite et al. (2013);[35] Rauber et al. (2013);[36] Buckstegge et al. (2014)[37] Warkentin et al. (2013);[38] Vega et al. (2014);[39] Konstantyner et al. (2014);[40] Poblacion et al. (2014);[41] Rauber et al. (2014);[42] Bortolini et al. (2015);[43] Bezerra et al. (2015);[44] Mayneris-perxachs et al. (2016);[45] Lima et al.(2018);[46] Rinaldi (2019);[47] Lucena et al. (2019);[48] Mendes et al. (2021);[49] Silva et al. (2020);[50] Rodrigues et al. (2020);[51] Batista et al. (2020);[52] Rebouças et al. (2020);[53] Pedraza (2021);[54] Mendes et al. (2021)[55].	1- Brazilian Socioeconomic Classification Criteria of the Brazilian Association of Population Studies (ABEP); 2-PNAD indicators*(Family income; parents' education; number of children; type of housing; number of people and number of rooms per house; Water supply and sanitation; 3- Children in public day-care centers. 4- Marital status of the mother. 5- Beneficiaries of the Bolsa Família Program.	1- Food insecurity; Malnutrition and anemia associated with low maternal education and environmental variables, such as type of housing, degree of crowding and type of sewage disposal. 2- High levels of morbidity associated with low levels of parental education, low access to health services and precarious housing conditions. 3- Breastfeeding for > 4 months associated with reduced frequency of head circumference deficit. 4- Greater immunization coverage, growth monitoring and prenatal care associated with a lower prevalence of inadequate weight gain. 5- Guidance regarding the quality of the diet in early childhood tends to last throughout childhood. 6- Hypovitaminosis "A" associated with low maternal education and low birth weight. 7- Mothers under 20 years old and with low income associated with a higher risk of early weaning.
HEALTH CONDITIONS (n = 16.783)	Schorling et al. (1990);[56] Agnew (1998);[57] Newman et al. (2001);[58] Barreto et al. (2006);[59] Brandt et al. (2012);[60] Lozer et al. (2013);[61] Viana et al. (2013);[62] Escobar et al. (2015);[63] Roque et al. (2017);[64] Ambrogi et al. (2021);[65] Alves et al. (2020);[66] Pina et al. (2020);[67] Ferreira et al. (2021);[68] Souza et al. (2022);[69] Mitter et al. (2012);[86]	1- Brazilian Socioeconomic Classification Criteria of the Brazilian Association of Population Studies (ABEP); 2-PNAD indicators*(Family income; maternal education; number of children; type of housing; number of people per home; waste disposal, access to drinking water. 3-Places of residence such as residents of favelas, indigenous, riverside or quilombola areas and multi-family residences.	1-High rates of diarrheal disease in children up to 5 years of age. 2-High degree of financial dependence on income transfer programs. 3- Exposure to infections by parasites, viruses and bacteria that cause diseases such as diarrhea, zika, tuberculosis, gastritis and stomach inflammation. 4-Increased risk to the mental and emotional health of children and mothers. 5-Greater risk of diarrhea among younger children

Table 3 (*Continued*)

| Study area and total sample number	Identification of studies 1st author and year of publication	Characterization of social vulnerability	Main outcomes presented in the studies
		4- Income transfer resource, emergency aid, 5- Situation of food insecurity.	associated with lower maternal education and lower family socioeconomic level. 6- High hospitalization rates for diseases of the respiratory system and infectious and parasitic diseases, with indigenous children being the most affected. 7-High prevalence of intestinal parasites among indigenous and riverside children associated with low environmental conditions.
DEVELOPMENT (*n* = 13.059)	Santos et al. (2008);[70] Lamy et al. (2011);[71] Mello et al. (2014);[72] Tella et al. (2018);[73] Pacheco et al. (2018);[74] Gonçalves et al. (2019);[75] Silva et al. (2019);[76] Correia et al. (2019);[77] Delgado et al. (2020);[78] Rocha et al. (2020);[79] Souza et al. (2021);[80] Morais et al. (2021);[81] Munhoz et al. (2022)[82]	1-Social class determined by the Brazilian Socioeconomic Classification Criteria of the Brazilian Association of Population Studies (ABEP). 2- PNAD indicators* (Family income and father's income; Education of the mother and/or father; whether there is running water; Own internal or external bathroom; Number of rooms and number of residents per household; Employment status of the head of family, number of siblings). 3-Place of residence - subnormal agglomeration (favela) in the census sector. 4-Income transfer benefit, 5-Percentage of women aged 10 to 29 responsible for households 6- Presence of the father. 7- House construction material 8-Family purchasing power	1-Delay in cognitive function associated with poor socioeconomic conditions. 2-Approximate probability of 50% of developmental delay in children from low-income families. 3-Low maternal education, paternal absence, inadequate sanitary conditions at home and in the neighborhood, low birth weight and short stature associated with delayed neuromotor development. 4- Adverse childhood experiences associated with low scores in five domains of child development: communication, gross motor coordination, fine motor coordination, personal and social problem solving. 5-Greater risk of hospital admissions due to Community-Acquired Pneumonia in children related to social vulnerability and inequity in these areas, as well as the difficulty of Primary Health Care in monitoring these children. 6-The better the home and daycare environment, the better the child's cognitive development.

Table 3 (*Continued*)

Study area and total sample number	Identification of studies 1st author and year of publication	Characterization of social vulnerability	Main outcomes presented in the studies
			7- Indication of lower prevalence of delay in poor families who participated in CCT programs compared to those who were eligible but did not participate.
DENTISTRY (*n* = 18.728)	Chaves et al. (2007);[83] Dini et al. (2000);[91] Rodrigues (2001);[92] Peres et al. (2003);[93] Ferreira et al. (2007);[94] Lima et al. (2016);[95] Cangussu et al. (2016);[96] Antunes et al. (2020)[97]	1-PNAD indicators (Family income; Education of the mother or guardian; Occupation of the head of the family; number of children, number of people per room, housing conditions, 2- Place of residence (living in a region considered poor).	1-Low socioeconomic status associated with a higher prevalence of tooth decay. 2-Children in daycare centers without guidelines for sugar consumption have a higher prevalence of cavities. 3-High rate of dental caries in children associated with low maternal education and low family income. 4-Infection and malnutrition during the period of tooth development, harmful to tooth enamel.
DENTISTRY AND NUTRITION (*n* = 1.018)	Oliveira et al. (2008)[84]	1-Family income, parents' education and number of children, own home, overcrowding (number of people per room.	1-Association between nutritional, socioeconomic factors and tooth decay. 2-Underweight children and those with adverse socioeconomic conditions and mothers with less than 8 years of education more likely to have cavities, including severe tooth decay.
NUTRITION AND HEALTH CONDITIONS (*n* = 6.597)	Viana et al. (2013);[62] Lima et al. (2010);[85] Pedraza (2016);[87] Marques et al. (2020);[88] Murray et al. (2023)[90]	1-Brazilian Economic Classification Criteria (CCEB); 2- Place of Residence: - Residents in indigenous communities. 3- Type of Residence: - Canvas residence. 4- Beneficiaries of the Bolsa Família Program. 5- Family purchasing power. 6-Situation of food insecurity	1-Significant reduction in new parasitic infections, especially by Giardia spp, with the intervention of vitamin A. 2-Higher prevalence of children hospitalized for pneumonia or diarrhea in Food Insecure households. 3-Food insecurity; anemia; zinc deficiency; high frequency of health problems; eosinophilia; parasitism and poly parasitism. 4-Underweight and insufficient weight associated with smoking mothers, with less than 4 years of schooling, up to 24 months between births.

Table 3 (*Continued*)

Study area and total sample number	Identification of studies 1st author and year of publication	Characterization of social vulnerability	Main outcomes presented in the studies
NUTRITION, HEALTH CONDITIONS AND DENTISTRY (*n* = 63)	Silveira et al. (2021)[89]	1-The study only states that they are children living in shelters for reasons such as: intra-family violence (physical or psychological), sexual abuse, sexual exploitation, neglect or abandonment.	1-The most prevalent disease was asthma, which is the main cause of hospitalization among Brazilian children and is positively associated with stress.

ABEP, Brazilian Association of Population Studies; CCEB, Brazilian Economic Classification Criteria; CCT, Collective Bargaining Agreement.

* Indices from PNAD - IPEA are used to define the Social Vulnerability Index (SVI); 16 indicators are utilized: waste collection, water and sewage, commuting time to work, infant mortality, children aged 0 to 5 out of school, children aged 6 to 14 out of school, children who neither study nor work, low income, young mothers (10 to 17 years), mothers without elementary education and with more children up to 15 years old, illiteracy, children in households where no one has completed elementary education, income up to R$255 (half the minimum wage in 2010), low income and dependency on the elderly, unemployment, child labor, and informal employment without elementary education.

** Two studies did not specify the sample size: Nutrition (Silva et al., 2020) and Health Conditions (Souza et al., 1999).[27]
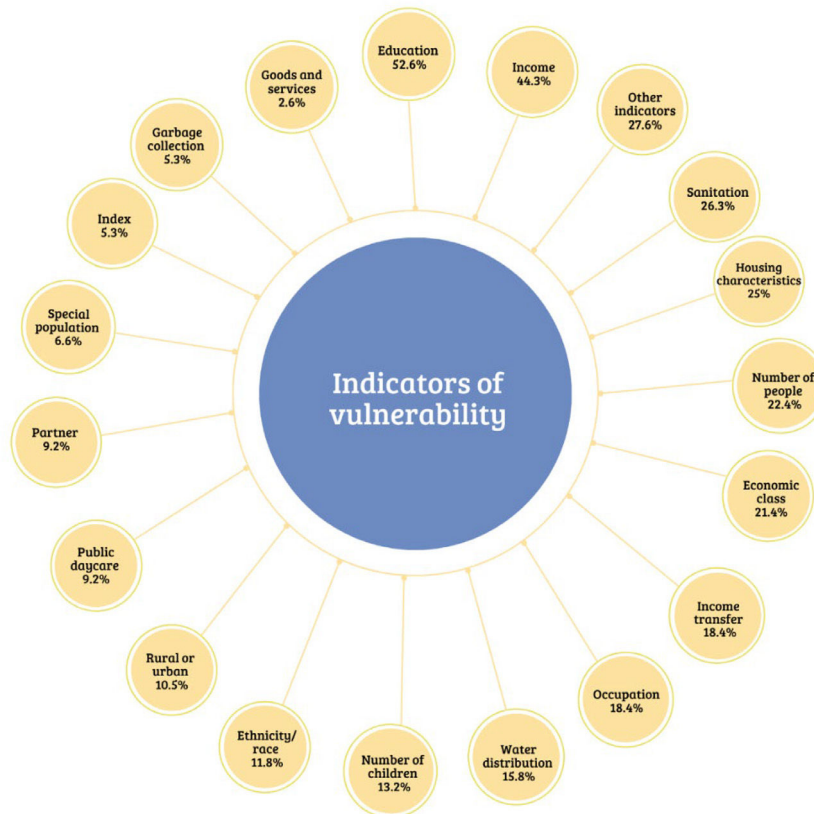
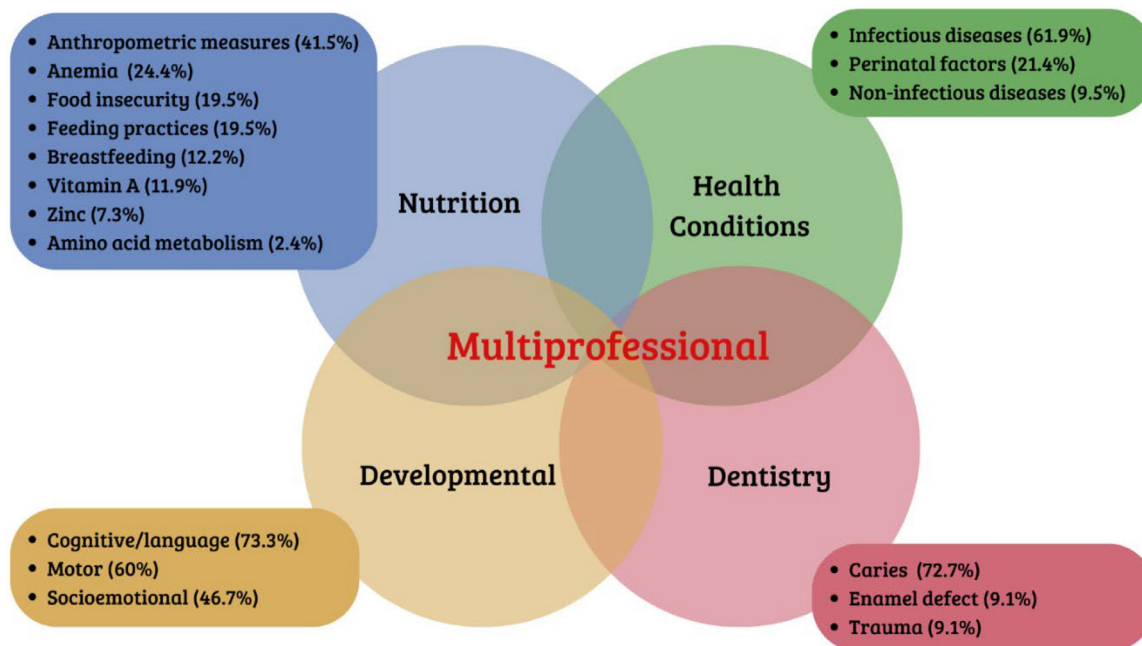**Figure 1**   Vulnerability indicators used in studies.

Figure 2 Main outcomes found in studies by area.

century. Until the end of the 1990s, only five more eligible studies were found, constituting 7.89% of the sample. These findings align with reports from authors such as Del Priore[100] and Romagnoli,[101] who, in addressing the history of childhood in Brazil, point to the invisibility of poor children in the country. Studies included from the 2000s onward represent 92.11% of the sample in this scoping review, coinciding with the expansion of public policies in the country. Additionally, Brazil is a signatory to important international treaties for early childhood development, such as the Convention on the Rights of the Child (CRC, 1989), the Universal Declaration of Human Rights (UDHR, 1948), and other international instruments for the defense of rights, such as the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs).[102,103]

It is important to highlight the nature of publications according to the national historical scenario. In the 1970s and 1980s, the country's concern was with infant mortality and malnutrition. For this reason, studies in the subsequent decades were mostly in the fields of nutrition and health conditions. With the improvement of living conditions in the country, better birth control, and the emergence of public policies such as the Family Health Strategy, Community Health Agents, and income transfer like the Family Allowance Program, there was a reduction in malnutrition and infant mortality rates. From that point on, studies related to early childhood development began to emerge.[104] It is noteworthy that only from the year 2008 onwards does a focus on child development appear in the studies.

Another aspect observed is the lack of standardization and often the fragility of indicators characterizing the social vulnerability of families. Less than 25% of the studies used well-known indicators such as the Brazil Economic Classification Criterion (CCEB) produced by the Brazilian Association of Companies and Research (ABEP) or the São Paulo Social

Vulnerability Index (IPVS) developed by the São Paulo State Data Analysis System Foundation (SEADE). Several studies used some items from the indicators of the National Household Sample Survey (PNAD). Other studies relied solely on places of residence or cohabitation, inferring a vulnerability condition, such as residents of slums, Indigenous communities, *quilombola* communities, rural areas, or those attending public daycare. Some studies only mentioned being a vulnerable population without presenting elements justifying such a condition. These findings are consistent with the literature, which reports a diversity of concepts or definitions of the term social vulnerability, among others.[6,7] In other words, in Brazil, there is no precise conceptual definition, as well as standardization of indicators capable of characterizing the condition of social vulnerability for more aligned use in research.[7]

The low educational level of parents or guardians is often highlighted in many studies as an indicator of social vulnerability, with this indicator most commonly associated with maternal education. Indeed, this is one of the most consistent indicators to reflect conditions related to childhood.[81,82] Studies consistently correlate low maternal education with negative outcomes in the lives of children, such as food insecurity, anemia, low birth weight, a higher incidence of dental caries, and worse rates of hospitalization for preventable causes, among others.[52,84,102] Historically, Brazil maintained high illiteracy rates. In 1940, the Brazilian Institute of Geography and Statistics (IBGE) surveys indicated that 56.7% of the Brazilian population aged 10 or older was illiterate. In 1970, this rate was 32.9%, and by the year 2000, it reached 16.7% for the same age group.[105] In this sense, it is essential to emphasize that education strongly influences the well-being of citizens. Higher levels of education are associated with longevity, better purchasing power, better health, and a lower likelihood of involvement in crime and violence.[79]

Regarding the outcomes and results of the studies, it was found that social vulnerability was consistently associated with worse outcomes. For example, food insecurity, malnutrition, and anemia appear as outcomes in a large part of the studies in the field of Nutrition. Similarly, infectious diseases in the field of health conditions and the presence of dental caries in Dentistry are highlighted. It is worth noting that interventions to combat malnutrition and infectious diseases in Brazil have reduced infant mortality and had an impact on improving other health conditions.[99] However, there are still areas of vulnerability in the country, such as the North and Northeast, and some mesoregions in Minas Gerais state. It is necessary not only to provide greater care for these children but also to implement public policies for economic improvement in these regions, considering that children exposed to poverty and exclusion face a higher risk of perpetuating poverty through generations.[9]

Another observed result is that all eligible studies in this scoping review are from the health field. Considering that the searches were not directed to any specific area, it was expected to find studies from other fields, such as education and social protection. This is especially noteworthy because there is a considerable number of articles that mention the population directly linked to the Social Protection Policy, that is, beneficiaries of income transfer programs such as Bolsa Família and others.[39,44,48-50,54,55,65,75,77,79,90] There is also within the scope of Social Protection the Comprehensive Family Care Program (PAIF) that benefits children in early childhood respect,[106] but in the present research, no studies on this topic were mapped. The same consideration applies to the field of education, which serves this population in early childhood education institutions.

In 2016, the Ministry of Health published a guiding document aimed at promoting early childhood through multisectoral actions, which includes offering parenting education programs, actions focused on food and nutrition, access to daycare and preschool, home visits to support families, and promotion actions in Primary Health Care.[5] In terms of national and international documents, there is recognition of the need for a joint intersectoral effort to promote the well-being of children in early childhood in situations of social vulnerability.[9,10,15,19] A good example of an intersectoral public policy is the Family Allowance income transfer program, implemented by Social Protection but with conditionalities to be met by beneficiaries in the Health and Education sectors.[107]

The percentage of intervention studies included in this review is less than 5%. This finding highlights the need to develop more research with this type of design. Intervention studies have the potential to identify interventions that can truly produce effective results, thereby guiding governments in the planning of public policies. Only two experimental studies and one quasi-experimental study were included in this review. One of these studies assessed the impact of a public policy, specifically the Best Early Childhood Program from the state of Rio Grande do Sul. This program proposes intervention for early childhood development through home visits from pregnancy to six years of age.[75] In a literature review, Batura et al. (2014)[105] analyzed intervention studies in early childhood in developed, medium-income, and low-income countries. The review discusses the importance of this type of study and emphasizes that multiple interventions, such as nutrition, stimulation, and family

care performed simultaneously, can ensure better lifelong outcomes. However, it warns that it costs more, and concludes that more studies on the cost-effectiveness of these interventions would help low- and middle-income countries choose this type of intervention.[105]

It is essential to conduct evaluations of existing government policies and programs. There were no studies that assessed the impact of state policies on improving conditions in early childhood in the country, even though Brazil has long had important income transfer programs, such as the Family Allowance Program, the PAIF, and the Family Health Strategy, among others. The research conducted over the years has provided a situational diagnosis, but it is essential to indicate interventions capable of contributing to overcoming the challenges imposed by the situation of social vulnerability. Therefore, studies with experimental or intervention designs are crucial. The scarcity of intervention studies in early childhood in Brazil is one of the gaps identified in this Scoping Review. The lack of production of studies in the fields of Education and Social Protection related to socially vulnerable early childhood is also highlighted. It is recommended, therefore, to produce more intervention studies, preferably of an intersectoral nature, capable of measuring the effectiveness of investments in important public policies focused on the needs of early childhood in the country.

In this review, 100% of the studies were in the health sector. Social vulnerability is not an isolated condition; it encompasses various challenges such as access to basic goods and services. The health, education, and social assistance sectors comprise the three main public policies of the Brazilian state, each with principles and guidelines based on the guarantee of citizens' rights as a state responsibility. Therefore, the complex needs of children in social vulnerability cannot be fully addressed without collaboration between health, education, and social protection. No study involving all three sectors was found in this review, highlighting the need for future research to investigate the benefits of cooperation among these sectors for children in situations of social vulnerability.

It is worth noting that this review has limitations. Despite a considerable sample that included 76 studies, there may be eligible studies that did not appear in the searches, especially as publications in Spanish were not included. Grey literature was also not searched. Another aspect concerns the lack of studies in the areas of Social Protection and Education. Although the search was comprehensive, it is possible that some important terms or keywords were missed. On the other hand, this study contributes by presenting the state of the art regarding Brazilian children in early childhood in situations of social vulnerability. It also highlights some existing gaps and provides recommendations.

Conclusion

This scoping review sought to verify what the country has achieved in terms of health, well-being, and child development in early Brazilian childhood and what studies reveal about this reality. The results revealed a significant increase in studies involving Brazilian children in early childhood in situations of social vulnerability over the last

two decades. The presented outcomes underscored that social vulnerability is extremely detrimental to early childhood, exposing children to various forms of preventable illnesses. The mapping conducted also suggests a growing awareness in the country regarding the importance of investing in the care and protection of this developmental phase, aiming to ensure a better future for children. Moreover, it allows us to infer that both the scientific community and state policy interests are aligned in contributing to overcoming the effects of social vulnerability in early childhood in Brazil.

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Conflicts of interest

The authors declare no conflicts of interest.

Supplementary materials

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References

1. O Impacto Do Desenvolvimento Na Primeira Infância Sobre a Aprendizagem. Comitê Científico do Núcleo Ciência Pela Infância; 2014, Estudo n 1. [cited 2023 Dec 5]. Available from: https://ncpi.org.br/publicacoes/impactodesenvolvimento/.
2. Morais RLS, Moreira RS, Costa KB. Intervenção Precoce: lidando com crianças de Risco Biológico e Psicossocial e suas Famílias. In: Camargos, ACR (Org.); Leite, HR. (Org.); Morais, RLS. (Org.); Lima, VP. (Org.). (Org.). Fisioterapia Em Pediatria: Da evidência a Prática clínica. 1ed.Rio De Janeiro. Medbook. 2019;1:19−42.
3. Plano Nacional Primeira Infância. 2010 - 2022 | 2020 - 2030 /Rede Nacional Primeira Infância (RNPI). Brasília, DF: ANDI Comunicação e Direitos. - 2ª ed. (revista e atualizada); 2020, RNPI/ANDI[Cited 2023 Dec 5]. Available from: https://andi.org.br/wpcontent/uploads/2021/07/andi-plano-nacional-pela-primeirainfancia-pnpiweb.pdf.
4. Figueiredo E.A. O Efeito da covid-19 sobre os indicadores de pobreza brasileira e as políticas de mitigação: uma discussão inicial. Notas da Presidência. N 7. Instituto de Pesquisa Econômica Aplicada − IPEA, 2022 5 jul;1−13. [Cited 2023 Dec 4]. Available from: https://repositorio.ipea.gov.br/bitstream/11058/11228/1/n_07_O_Efeito_da_Covid_19.pdf
5. Brasil. Ministério da Saúde. Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Síntese De Evidências Para Políticas De saúde: Promovendo o Desenvolvimento Na Primeira infância.
− Brasília: Ministério da Saúde. Departamento de Ciência e Tecnologia; 2016. p. 64.. Available from:https://bvsms.saude.gov.br/bvs/publicacoes/sintese_evidencias_politicas_primeira_infancia.pdf.
6. Scott JB, Prola CA, Siqueira AC, Pereira CR. The concept of social vulnerability in the realm of psychology in brazil: a systematic review of the literature. Psicol Rev. 2018;24:600−15.
7. Costa M.A., Santos M.P., Marguti B.O., Pirani N.C., Pinto C.V., Curi R.L., et al. Vulnerabilidade social no Brasil: conceitos, métodos e primeiros resultados para municípios e regiões metropolitanas brasileiras. 2018 Jan 1 [cited 2023 Dec 4]; Available from: https://repositorio.ipea.gov.br/handle/11058/8257?mode=full
8. Campos GW, Bonfim JR, Minayo MC, Akerman M, Drumond Junior M, Carvalho YM. Tratado De Saúde Coletiva. São Paulo: Editora Hucitec; 2006. p. 880..
9. UNICEF. As Múltiplas Dimensões Da Pobreza na Infância e na Adolescência no Brasil. [Cited 2023 Dec 4]. Available from: https://www.unicef.org/brazil/media/22676/file/multiplas-dimensoes-dapobreza-nainfancia-e-na-adolescencia-no-brasil.pdf.
10. Brasil. Ministério do Desenvolvimento Social e Combate à Fome. Política Nacional De Assistência Social − PNAS, Aprovar Pelo Conselho Nacional De Assistência Social Por Intermédio Da Resolução n° 145, De 15 De Outubro De 2004, e Publicado No Diário Oficial Da União − DOU Do Dia 28 De Outubro De 2004. Secretaria Nacional de Assistência Social; 2023, [Internet]. [CitedDec 4]. Available from: https://www.mds.gov.br/webarquivos/publicacao/assistencia_social/Normativas/PNAS2004.pdf.
11. Britto PR, Lye SJ, Proulx K, Yousafzai AK, Matthews SG, Vaivada T, et al. Nurturing care: promoting early childhood development. Lancet. 2017;389:91−102.
12. Walker SP, Wachs TD, Meeks JG, Lozoff B, Wasserman GA, Pollitt E, et al. Child development: risk factors for adverse outcomes in developing countries. Lancet. 2007;369:145−57.
13. Black RE, Allen LH, Bhutta ZA, Caulfield LE, de Onis M, Ezzati M, et al. Maternal and child undernutrition: global and regional exposures and health consequences. Lancet. 2008;371:243−60.
14. Caulfield LE, de Onis M, Blössner M, Black RE. Undernutrition as an underlying cause of child deaths associated with diarrhea, pneumonia, malaria, and measles. Am J Clin Nutr. 2004;80:193−8.
15. Black MM, Walker SP, Fernald LC, Andersen CT, DiGirolamo AM, Lu C, et al. Early childhood development coming of age: science through the life course. Lancet. 2017;389:77−90.
16. Constituição da República Federativa do Brasil. Brasília: Senado Federal; Planalto.gov.br 1988. [Cited 2023 Dec 13]. Available from: https://www.planalto.gov.br/ccivil_03/Constituicao/Constituicao.htm
17. Estatuto da criança e do adolescente. Brasília. Planalto.gov.br. 1990. [Cited 2023 Dec 13]. Available from: https://www.planalto.gov.br/ccivil_03/leis/L8069.htm
18. Fonseca FF, Sena RK, Santos RL, Dias OV, Costa SM. The vulnerabilities in childhood and adolescence and the Brazilian public policy intervention. Rev Paul Pediatr. 2013;31:258−64.
19. Marino, E. Harasawa E., Pluciennik G.A. [organizadores]. Dez passos para implementar um programa para a primeira infância − 1. ed. − São Paulo: Fundação Maria Cecília Souto Vidigal, 2014. − (Coleção primeiríssima infância; v. 1). [Cited 2023 Dec 13]. Available from: https://sinapse.gife.org.br/download/dez-passos-para-implementarum-programa-para-a-primeirissima-infancia-v.1
20. Souza LB, Aragão FB, Cunha JH, Fiorati RC. Intersectoral actions in decreasing social inequities faced by children and adolescents. Rev Latino-Am Enfermagem. 2021;29:e3427.

21. Peters MD, Godfrey CM, Khalil H, McInerney P, Parker D, Soares CB. Guidance for conducting systematic scoping reviews. Int J Evid Based Healthc. 2015;13:141−6.

22. Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. Ann Intern Med. 2018;169:467−73.

23. Donangelo CM, Azevedo CE. Serum zinc in Brazilian children of families of low income. Arch Latinoam Nutr. 1984;34:290−7.

24. Victora CG, Vaughan JP, Kirkwood BR, Martines JC, Barcelos LB. Risk factors for malnutrition in Brazilian children: the role of social and environmental variables. Bull World Health Organ. 1986;64:299−309.

25. Post CL, Victora CG, Barros AJ. [Low prevalence of body-weight-for-height deficit: comparison of stunned and no-stunned Brazilian children]. Rev Saude Publica. 1999;33:575−85.

26. Souza AC, Peterson KE, Cufino E, Gardner J, Craveiro MV, Ascherio A. Relationship between health services, socioeconomic variables and inadequate weight gain among Brazilian children. Bull World Health Organ. 1999;77:895−905.

27. Silva MV, Ometto AMH, Furtuoso MCO, Pipitone MAP, Sturion GL. [Access to day-care centers and the nutritional status of Brazilian children: regional differences by age group and income class]. Rev Nutr. 2000;13:193−9.

28. Post CLA, Victora CG, Barros AJD. Understanding the low prevalence of weight-for-height deficit in lower-income Brazilian children: correlations among anthropometric values. Cad Saude Publica. 2000;16:73−82.

29. Nogueira CA, Ricco RG, Del Ciampo LA, de Souza AM, Oliveira JE. Growth and hematological studies on Brazilian children of low socioeconomic level. Arch Latinoam Nutr. 2001;51:230−5.

30. Oliveira MN, Martorell R, Phuong N. Risk factors associated with hemoglobin levels and nutritional status among Brazilian children attending daycare centers in Sao Paulo city, Brazil. Arch Latinoam Nutr. 2010;60:23−9.

31. Domene SM, Medeiros MA, Martins PA. Breastfeeding dynamics among families on social vulnerability. Rev Nutr, Campinas. 2011;24:71−7.

32. Ferreira HS, Xavier Júnior AF, Assunção ML, Santos EA, Horta BL. Effect of breastfeeding on head circumference of children from impoverished communities. Breastfeed Med. 2013;8:294−301.

33. Ferreira HS, Moura RM, Assunção ML, Horta BL. [Factors associated with hypovitaminosis A in children aged under five years]. Rev Bras Saude Mater Infant. 2013;13:223−35.

34. Santos LP, Gigante DP. Relationship between food insecurity and nutritional status of Brazilian children under the age of five. Rev Bras Epidemiol. 2013;16:984−94.

35. Leite MS, Cardoso AM, Coimbra CE, Welch JR, Gugelmin SA, Lira PCI, et al. Prevalence of anemia and associated factors among indigenous children in Brazil: results from the First National Survey of Indigenous People's Health and Nutrition. Nutr J. 2013;12:69.

36. Rauber F, Hoffman DJ, Vitolo MR. Diet quality from pre-school to school age in Brazilian children: a 4-year follow-up in a randomized control study. Br J Nutr. 2014;111:499−505.

37. Buckstegge AK, Reichert L, Ferreira F, Fraiz FC, Cristina M. Weaning and associated factors in children from low-income communities. Rev Odontol UNESP. 2014;43:172−9.

38. Warkentin S, Taddei JA, KdeJ Viana, Colugnati FA. Exclusive breastfeeding duration and determinants among Brazilian children under two years of age. Rev Nutr, Campinas. 2013;26:259−69.

39. Vega JB, Taddei JA, Poblacion AP. Socio-demographic and nutritional characteristics of Brazilian children under 2 years of age who were beneficiaries of conditional cash transfer programs in 2006. Cienc Saude Coletiva. 2014;19:931−42.

40. Konstantyner T, Warkentin S, Taddei JA. Prevalence and determinants of vitamin A deficiency among Brazilian children under 2 years of age from the 2006 National Demographic Health Survey. Food Nutr Bull. 2014;35:422−30.

41. Poblacion AP, Cook JT, Marín-León L, Segall-Corrêa AM, Silveira JA, Konstantyner T, Taddei JA. 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 Nutr Bull. 2016;37:585−98.

42. Rauber F, da Costa, Louzada ML, Vitolo MR. Healthy eating index measures diet quality of Brazilian children of low socio-economic status. J Am Coll Nutr. 2014;33:26−31.

43. Bortolini GA, Vitolo MR, Gubert MB, Santos LM. [Social inequalities influence the quality and diversity of diet in Brazilian children 6 to 36 months of age]. Cad Saude Publica. 2015;31:2413−24.

44. Bezerra TA, Pedraza DF. Food (in)security in families with children under five years of age living in socially vulnerable areas of Campina Grande, Paraíba, Brazil. Rev Nutr, Campinas. 2015;28:655−65.

45. Mayneris-Perxachs J, Lima AA, Guerrant RL, Leite ÁM, Moura AF, Lima NL, et al. Urinary N-methylnicotinamide and β-amino-isobutyric acid predict catch-up growth in undernourished Brazilian children. Sci Rep. 2016;6:19780.

46. Lima DB, Damiani LP, Fujimori E. Vitamin A deficiency in Brazilian children and associated variables. Rev Paul Pediatr. 2018;36:176−85.

47. Rinaldi AE, Conde WL. Socioeconomic inequality in dietary intake begins before 24 months in Brazilian children. Rev Saude Publica. 2019;53:9.

48. Lucena PN, Bueno NB, Vieira KA, Cabral MJ, Clemente AP, Florêncio TM. Food insecurity and weight status of socially vulnerable child beneficiaries of a food assistance programme in Maceió, Northeast Brazil. Public Health Nutr. 2019;23:721−6.

49. Mendes MM, Marçal GM, Fragoso MD, Florêncio TM, Bueno NB, Clemente AP. Association between iron deficiency anaemia and complementary feeding in children under 2 years assisted by a Conditional Cash Transfer programme. Public Health Nutr. 2021;24:4080−90.

50. Silva DL, Höfelmann DA, Taconeli CA, Lang RM, Dallazen C, Tietzmann DC, et al. Individual and contextual predictors of children's hemoglobin levels from Southern Brazilian municipalities in social vulnerability. Cad Saude Publica. 2021;36:e00166619.

51. Rodrigues AM, Santos ED, Faria TP, Faria AL, Chamon EM. Food Security of families with preschool children in rural areas of the Vale do Paraíba in São Paulo. Demetra. 2020;15:e42451.

52. Batista L, Paiva A, Teles L, Rondó P, Diaz-Quijano F, Batista-Sousa L. Anaemia among children living in land reform colonization projects in the Northeast region of Brazil: a population-based cross-sectional study. Rev Chil Nutr. 2020;47:423−9.

53. Rebouças AG, Bernardino IM, Dutra ER, Imparato JCP, Duarte DA, Flório FM. Factors associated with feeding practices among Brazilian children aged 12 to 23 months old. Rev Bras Saude Mater Infant. 2020;20:1025−40.

54. Pedraza DF. Food and nutrition insecurity among families with children under five years of age in the Metropolitan Region of João Pessoa, Paraíba, Brazil. Cien Saude Colet. 2021;26:1511−20.

55. Mendes MM, Marçal GM, Rinaldi AE, Bueno NB, Florêncio TM, Clemente AP. Dietary patterns of children aged 6-24 months assisted by the Bolsa Família Program. Public Health Nutr. 2021;25:1−11.

56. Schorling JB, Wanke CA, Schorling SK, Mcauliffe JF, de Souza MA, Guerrant RL. A prospective study of persistent diarrhea among children in an urban Brazilian slum. Am J Epidemiol. 1990;132:144−56.

57. Agnew DG, Lima AA, Newman RD, Wuhib T, Moore RD, Guerrant RL, et al. Cryptosporidiosis in Northeastern Brazilian children: association with increased diarrhea morbidity. J Infect Dis. 1998;177:754−60.

58. Newman RD, Moore SR, Lima AAM, Nataro JP, Guerrant RL, Sears CL. A longitudinal study of Giardia lamblia infection in North-East Brazilian children. Trop Med Int Health. 2001; 6:624−34.

59. Barreto ML, Milroy C, Strina Agostino, Prado S, Paulo J, Antônio E, et al. Community-based monitoring of diarrhea in urban Brazilian children: incidence and associated pathogens. Trans R Soc Trop Med Hyg. 2006;100:234−42.

60. Brandt K, Taddei CR, Takagi EH, Oliveira FF, Duarte RT, Irino I, et al. Establishment of the bacterial fecal community during the first month of life in Brazilian newborns. Clinics. 2012;67:113−23.

61. Lozer DM, Souza TB, Monfardini MV, Vicentini F, Kitagawa SS, Scaletsky IC, et al. Genotypic and phenotypic analysis of diarrheagenic Escherichia coli strains isolated from Brazilian children living in low socioeconomic level communities. BMC Infect Dis. 2013;13:418.

62. Viana KdeJ, Taddei JA, Cocetti M, Warkentin S. [Birth weight in Brazilian children under two years of age]. Cad. Saude Publica. 2013;29:349−56.

63. Escobar AL, Coimbra CE, Welch JR, Horta BL, Santos RV, Cardoso AM. Diarrhea and health inequity among Indigenous children in Brazil: results from the First National Survey of Indigenous People's Health and Nutrition. BMC Public Health. 2015;15:191.

64. Roque JR da S, Machado RS, Rodrigues D, Rech P, Kawakami E. Prevalence of Helicobacter pylori infection in an indigenous community in São Paulo and associated factors: cross-sectional study. Sao Paulo Med J. 2017;135:140−5.

65. Ambrogi IG, Brito L, Diniz D. The vulnerabilities of lives: Zika, women and children in Alagoas State, Brazil. Cad Saude Publica. 2021;36:e00032020.

66. Alves YM, Berra TZ, Alves LS, de Assis IS, Arcoverde MA, Ramos AC, et al. Risk areas for tuberculosis among children and their inequalities in a city from Southeast Brazil. BMC Pediatr. 2020;20:462.

67. Pina JC, Alves LS, Arroyo LH, Arcêncio RA, Gondim Ellen C, Cândida M, et al. Using geo-spatial analysis for assessing the risk of hospital admissions due to community-acquired pneumonia in under-5 children and its association with socially vulnerable areas (Brazil). BMC Pediatr. 2020;20:502.

68. Ferreira AA, Souza MC, Cardoso AM, Horta BL, Santos RV, Welch JR, et al. Birth weight of indigenous children in Brazil: results of the First National Survey of Indigenous People's Health and Nutrition. Cad Saude Publica. 2021;37:e00228120.

69. Souza MP, da Natividade MS, Werneck GL, dos Santos DN. Congenital Zika syndrome and living conditions in the largest city of northeastern Brazil. BMC Public Health. 2022;22:1231.

70. Santos DN, Assis AM, Bastos AC, Santos LM, Santos CA, Strina A, et al. Determinants of cognitive function in childhood: a cohort study in a middle income context. BMC Public Health. 2008;8:202.

71. Lamy FF, de Medeiros SM, Lamy ZC, Moreira ME. Home environment and alterations in the development of children in a community of the outskirts of São Luís - MA. Cien Saude Colet. 2011;16:4181−7.

72. de Mello EQ, S Motta-Gallo, Goulart FC, Herrero D, Gallo PR. Motor development of Brazilian breastfeeding infants in socially unfavorable condition of life. J Human Growth Dev. 2014;24:163−7.

73. Tella P, Piccolo LD, Rangel ML, Rohde LA, Polanczyk GV, Miguel EC, et al. Socioeconomic diversities and infant development at 6 to 9 months in a poverty area of São Paulo, Brazil. Trends Psychiatry Psychother. 2018;40:232−40.

74. Pacheco MJ, Gonçalves H, Ribeiro TG, Gonçalves TH, Pacheco MB, Ribeiro MR, et al. Low weight at birth and unfavorable socioeconomic background: effects on language and fluid intelligence. Vulnerable Child Youth Stud. 2018;13:368−73.

75. Gonçalves TR, Duku E, Janus M. Developmental health in the context of an early childhood program in Brazil: the "Primeira Infância Melhor" experience. Cad Saude Publica. 2019;35: e00224317.

76. Silva EP, Ludermir AB, Lima M de C, Eickmann SH, Emond A. Mental health of children exposed to intimate partner violence against their mother: a longitudinal study from Brazil. Child Abuse Negl. 2019;92:1−11.

77. Correia LL, Rocha HA, Sudfeld CR, Rocha SG, Leite AJ, Campos JS, Silva AC. Prevalence and socioeconomic determinants of development delay among children in Ceará, Brazil: a population-based study. PLoS One. 2019;14:e0215343.

78. Delgado DA, Michelon RC, Gerzson LR, de Almeida CS, Alexandre M da G. Evaluation of child motor development and its association with social vulnerability. Fisioter Pesqui. 2020;27: 48−56.

79. Rocha HA, Sudfeld CR, Leite AJ, Rocha SG, Machado MM, Campos JS, et al. Adverse childhood experiences and child development outcomes in Ceará, Brazil: a population-based study. Am J Prev Med. 2021;60:579−86.

80. Souza LB, Aragão FB, Cunha JH, Fiorati RC. Intersectoral actions in decreasing social inequities faced by children and adolescents. Rev Lat Am Enfermagem. 2021;29:e3427.

81. de Souza MR, de Castro ML, Nobre JN, Pinto PF, da Rocha NK, Carvalho AM. Quality of the home, daycare and neighborhood environment and the cognitive development of economically disadvantaged children in early childhood: a mediation analysis. Infant Behav Dev. 2021;64:101619.

82. Munhoz TN, Santos IS, Blumenberg C, Barcelos RS, Bortolotto CC, Matijasevich A, et al. Factors associated infant development in Brazilian children: baseline of the impact assessment of the Happy Child Program. Cad Saude Publica. 2022;38: e00316920.

83. Chaves AM, Rosenblatt A, Oliveira OF. Enamel defects and its relation to life course events in primary dentition of Brazilian children: a longitudinal study. Community Dent Health. 2007;24:31−6.

84. Oliveira LB, Sheiham A, Bönecker M. Exploring the association of dental caries with social factors and nutritional status in Brazilian preschool children. Eur J Oral Sci. 2008;116:37−43.

85. Lima AA, Soares AM, Lima NL, Mota RM, Maciel BL, Kvalsund MP, et al. Effects of vitamin A supplementation on intestinal barrier function, growth, total parasitic, and specific Giardia spp infections in Brazilian children: a prospective randomized, double-blind, placebo-controlled trial. J Pediatr Gastroenterol Nutr. 2010;50:309−15.

86. Mitter SS, Oriá RB, Kvalsund MP, Pamplona P, Joventino ES, Mota RM, et al. Apolipoprotein and the influences growth and cognitive responses to micronutrient supplementation in shantytown children from northeast Brazil. Clinics. 2012;67:11−8.

87. Pedraza DF. Health and nutrition status of children assisted in public daycare centers of Campina Grande. Paraíba. Cad Saude Coletiva. 2016;24:200−8.

88. Marques RC, Bernardi JV, Dorea CC, Dórea JG. Intestinal parasites, anemia and nutritional status in young children from transitioning western Amazon. Int J Environ Res Public Health. 2020;17:577.

89. Silveira AC, Leite AJ, Cabral PC, de Oliveira AC, de Oliveira KA, de Lira PI. Toxic stress, health and nutrition among Brazilian children in shelters. BMC Pediatr. 2021;21:112.

90. Murray J, Bauer A, Loret de Mola C, Martins RC, Blumenberg C, Esposti MD, et al. Child and maternal mental health before and during the COVID-19 pandemic: longitudinal social

inequalities in a Brazilian birth cohort. J Am Acad Child Adolesc Psychiatry. 2023;62:344−57.

91. Dini EL, Holt RD, Bedi R. Caries and its association with infant feeding and oral health-related behaviors in 3-4-year-old Brazilian children. Community Dent Oral Epidemiol. 2000;28:241−8.

92. Rodrigues CS, Sheiham A. The relationships between dietary guidelines, sugar intake and caries in primary teeth in low income Brazilian 3-year-olds: a longitudinal study. Int J Paediatr Dent. 2001;10:47−55.

93. Peres MA, Peres KG, Antunes JL, Junqueira SR, Frazão P, Narvai PC. The association between socioeconomic development at the town level and the distribution of dental caries in Brazilian children. Rev Panam Salud Publica. 2003;14:149−57.

94. Ferreira SH, Béria JU, Kramer PF, Feldens EG, Feldens CA. Dental caries in 0- to 5-year-old Brazilian children: prevalence, severity, and associated factors. Int J Paediatr Dent. 2007;17:289−96.

95. Lima CV, Pierote JJ, de Santana Neta HA, de Deus Mde L, de Deus ML, et al. Caries, Toothbrushing habits, and fluoride intake from toothpaste by Brazilian children according to socioeconomic status. Pediatr Dent. 2016;38:305−10.

96. Cangussu MC, Cabral MB, Mota EL, Vianna MI. Risk factors for dental caries in early childhood in Salvador, in the Brazilian State of Bahia. Rev Bras Saude Mater Infant. 2016;16:57−65.

97. Antunes LA, Ornellas G, Fraga RS, Antunes LS. Oral health outcomes: the association of clinical and socio-dental indicators to evaluate dental caries in preschool children. Cien Saude Colet. 2020;23:491−500.

98. Souza DDH, Suárez S, Koenig MA. Selective trust and theory of mind in Brazilian children: effects of socioeconomic background. J Cognit Dev. 2021;22:169−84.

99. Dalglish SL, Vogel JJ, Begkoyian G, Huicho L, Mason E, Root ED, et al. Future directions for reducing inequity and maximising impact of child health strategies. BMJ. 2018;362:k2684.

100. Del Priore M. História das crianças no Brasil. Rio de Janeiro: Editora Contexto; 1998. p. 450.

101. Romagnoli RC. Problematizing the concepts of vulnerability and social risk in the work routine of the SUAS (Brazilian Unified Social Assistance Systems). Psicol Estud. 2015;20:449−59.

102. Victora CG, Aquino EM, do Carmo Leal M, Monteiro CA, Barros FC, Szwarcwald CL. Maternal and child health in Brazil: progress and challenges. Lancet. 2011;377:1863−76.

103. Barros FC, Matijasevich A, Requejo JH, Giugliani E, Maranhão AG, Monteiro CA, et al. Recent trends in maternal, newborn, and child health in Brazil: progress toward millennium development goals 4 and 5. Am J Public Health. 2010;100:1877−89.

104. Amaral EF, Monteiro VP. Avaliação de Impacto das condicionalidades de educação do Programa Bolsa Família (2005 e 2009). Dados. 2013;56:531−70.

105. Batura N, Hill Z, Haghparast-Bidgoli H, Lingam R, Colbourn T, Kim S, et al. Highlighting the evidence gap: how cost-effective are interventions to improve early childhood nutrition and development? Health Policy Plan. 2014;30:813−21.

106. Brasil. Lei N 12.435, de 6 de julho de 2011. Altera a Lei N° 8.742, De 7 De Dezembro De 1993, Que Dispõe Sobre a Organização Da Assistência Social. Brasília[Cited 2022 Apr 30] Available from: https://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/lei/l12435.htm.

107. Brasil. Ministério da Saúde. Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Ciência e Tecnologia. Síntese De Evidências Para Políticas De saúde: Promovendo o Desenvolvimento Na Primeira Infância [Internet]. Portaldeboaspraticas.Iff.Fiocruz.Br. [cited 2023 Dec 4]. Available from: https://portaldeboaspraticas.iff.fiocruz.br/biblioteca/sintese-de-evidencias-para-politicas-de-saude-promovendo-o-desenvolvimento-na-primeira/