



Sociodemographic determinants associated with breastfeeding in term infants with low birth weight in Latin American countries

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Abstract

BACKGROUND

A progressive decrease in exclusive breastfeeding (BF) is observed in Latin America and the Caribbean compared with global results. The possibility of being breastfed and continuing BF for > 6 months is lower in low birth weight than in healthy-weight infants.

AIM

To identify factors associated with BF maintenance and promotion, with particular attention to low- and middle-income countries, by studying geographic, socioeconomic, and individual or neonatal health factors.

METHODS

A scoping review was conducted in 2018 using the conceptual model of social determinants of health published by the Commission on Equity and Health Inequalities in the United States. The extracted data with common characteristics were synthesized and categorized into two main themes: (1) Sociodemographic factors and proximal determinants involved in the initiation and maintenance of BF in low-birth-weight term infants in Latin America; and (2) individual characteristics related to the self-efficacy capacity for BF maintenance and adherence in low-birth-weight term infants.

RESULTS

This study identified maternal age, educational level, maternal economic capacity, social stratum, exposure to BF substitutes, access to BF information, and quality of health services as mediators for maintaining BF.

CONCLUSION

Individual self-efficacy factors that enable BF adherence in at-risk populations should be analyzed for better health outcomes.

Key Words: Breastfeeding; Low birth weight; Latin America; Self-efficacy; Social determinants of health

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Core Tip: Analyzing sociodemographic and individual conditions for maintaining breastfeeding (BF) is fundamental for meeting the second sustainable developmental goal. However, analysis of the feeding behavior in low-birth-weight term newborns in Latin America is limited. Few studies have assessed the mediating factors for BF maintenance, paving the way for the challenges faced by at-risk populations, mainly in developing countries. Evidence-based interventions should be based on an understanding of the social and individual factors affecting feeding practices for at-risk populations.

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INTRODUCTION

The United Nations Children's Fund and the World Health Organization estimated that one in seven live births will be underweight by 2020, which is equivalent to 19.8 million babies worldwide. The prevalence of all low-birth-weight infants with stunting and wasting in early childhood is approximately 70% in South Asia and sub-Saharan Africa[1]. The variation has been minimal in Latin America, maintaining a prevalence between 12% and 9.6% over the last decade[1]. No region has experienced significant changes in the prevalence since 2012, preventing the achievement of the low-birth-weight target set by the World Health Assembly for 2030[1]. In this context, low birth weight is considered a public health problem associated with the newborn's well-being because of the high risk of acquiring diseases or disabilities that affect physical and cognitive development and as a predictor of morbidity and mortality[2].

In this sense, access to breastfeeding (BF) is essential and indicates better child health outcomes. However, the likelihood of being breastfed and continuing BF for > 6 months in low-birth-weight infants is lower than that in healthy-weight infants. Underweight children without adequate nutrition have an increased risk of fetal and neonatal death in the first years of life, physical and cognitive growth retardation, and increased chronic diseases later in the perinatal period, childhood, and adulthood[3].

In this regard, the literature has shown the benefits of BF in newborns and infants, and sociodemographic determinants associated with its maintenance are of particular relevance, mainly in low- and middle-income regions[4]. The individual characteristics of the mother and newborn, associated with cultural feeding practices, as well as social and health system determinants, are some factors that influence BF practices[5].

Smoking, schooling, obstetric conditions, newborn complications that require separation from the dyad, and BF education have been identified as moderating individual characteristics factors of feeding practices of the mothers associated with the initiation and continuation of BF[6]. Moreover, conditions specific to the BF woman, such as self-efficacy and her family nucleus, especially the emotional and mental situation, can contribute to the abandonment of BF [6]. Geographical, socioeconomic, and individual factors and health complications are among the factors associated with late or impossible BF initiation in low-birth-weight infants during the first hour postpartum[7,8].

The trend in improving BF duration in Latin America and the Caribbean depends not only on the policies implemented by each government but also on the particularities of population subgroups[9]. However, studies related to BF and nutrition in low-birth-weight term infants have generally been limited, mainly due to the difficulty in generating reference parameters to observe nutritional behaviors and their impact on the neuro-physical development of the child; therefore, efforts have been directed to preterm infants and those with adequate weight for gestational age, for whom follow-up scales have been constructed[10,11].

Global studies have identified the significant variability of feeding practices in low-birth-weight populations[9], reporting the prevalence of BF and its association with socioeconomic conditions of the environment. However, the findings are more limited to Latin America, a region characterized by vast social inequalities, mainly to materializing social policies affecting the health and educational system and generally satisfying basic needs[12].

In this context, aspects related to health equity are considered as determinants. The absence of social, economic, and demographic guarantees can influence the initiation and adherence to BF in low-birth-weight infants[9]; some cultural and social factors can interfere with the promotion and support of BF to ensure adherence. Consequently, sociodemographic determinants and individual conditions associated with BF should be analyzed in low-birth-weight term infants in Latin American countries from a health inequity perspective.

MATERIALS AND METHODS

A scoping review was performed based on five phases proposed by Arksey and Malley[13] and reports according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement[14].

For the present review, the 2018 conceptual model of social determinants of health published by the Commission on Equity and Health Inequalities in the United States was adopted. The social position was considered a central component and an explanatory construct that allows determining the representations of inequality, including income, education, occupation, gender, ethnic belonging, and other dimensions, to determine the health distribution and well-being in the population mediated by the so-called proximate or intermediary determinants, which include material circumstances, social cohesion, human behavior, genetic inheritance, and health system organization[15].

The concept of self-efficacy was determined according to Bandura (1987), who defined it as judgments of each individual about their abilities and use to organize and execute actions with the highest possible performance, contributing to the achievement of human accomplishments and increased motivation[16].

Phase 1: Identification of research questions

This review addresses the following research questions: (1) What sociodemographic factors are involved in initiating and maintaining BF in low-birth-weight term infants in Latin America; (2) What proximal health determinants are involved in the inequality of BF maintenance and adherence in low-birth-weight term infants; and (3) What individual characteristics are related to self-efficacy for BF maintenance and adherence in low-birth-weight term infants?

Phase 2: Identification of relevant studies

The search strategy included articles published in Medline, Embase, OvidSP, CINAHL, and the Latin American and Caribbean Health Sciences Database using the Medical Subject Headings MeSH and DeCS terms reference list. The combinations of search terms using Boolean operators “AND” and “OR” were as follows: Social determinants of health AND self-efficacy AND breastfeeding AND infant, and low birth weight ([Supplementary material](#)). Additional information was obtained by manually searching the reference lists of relevant articles. Full-text articles published up to 2022 using qualitative and quantitative methodologies were considered. The search strategy was limited to English and Spanish studies. Commentaries, editorials, opinion articles, and book chapters were excluded.

Phase 3: Selection of studies

In this phase, the following aspects were contemplated: (1) Construction of search formulas elaborated by an experienced research team member; (2) Identification of the search strategy by database exploring the best scientific evidence; and (3) Analysis of titles and abstracts to select relevant studies. Subsequently, three researchers assessed the titles and abstracts of the identified publications and independently performed data extraction. Discrepancies were discussed and resolved by consensus.

Phase 4: Data analysis

The organization and thematic analysis of the scientific evidence was carried out in the Excel program with data extraction such as bibliographic source, study purpose, country of origin, study type, design, sociodemographic characteristics, cultural characteristics, type of BF, and individual aspects of the mother in terms of self-efficacy and knowledge gaps ([Table 1](#)). During the process, three reviewers compared the authors' contributions and sociodemographic characteristics of individual conditions responsible for initiating and sustaining BF in low-birth-weight term infants.

Phase 5: Collate, summarize, and communicate the results

The extracted data with common characteristics were synthesized and categorized into two main themes: (1) Sociodemographic factors and proximal determinants involved in the initiation and maintenance of BF in low-birth-weight term infants in Latin America; and (2) Individual characteristics related to the capacity for self-efficacy for BF maintenance and adherence in low-birth-weight term infants ([Tables 2 and 3](#)).

RESULTS

Search flow and study characteristics

The search strategy identified 1483 articles; 1263 studies were excluded. Sixty full-text articles were reviewed, and 47 articles were excluded. Eleven studies were finally included after applying the study criteria for synthesizing the results ([Figure 1](#)). One clinical trial was identified in the 11 selected studies. Most participants were recruited through convenience sampling, and 46% used comparison groups. [Table 1](#) shows the primary characteristics of the included studies.

Sociodemographic factors involved in the initiation and maintenance of BF with low-birth-weight term infants in Latin America

Seven observational studies have reported sociodemographic factors and proximal determinants associated with BF adherence and maintenance in low-birth-weight term infants. Studies have focused on identifying the prevalence of BF, feeding patterns, and associated factors for its maintenance. Most BF reported in the study population ranged from 34.7%

Table 1 Main characteristics of the included studies

Ref.	Location	Study design	Type of Sampling	Sample size LWB	Control group	Measurements	Analysis
Lizarazo <i>et al</i> [2], 2023	Colombia	Observational	Convenience	25	No	Investigator-designed survey. Medical records	Descriptive analysis
Ortelan <i>et al</i> [18], 2020	Brazil	Observational	Probabilistic	2370	No	Questionnaire on sociodemographic characteristics of mothers and breast milk consumption. BF prevalence survey	Poisson regression
Agudelo <i>et al</i> [23], 2021	Colombia	Clinical trial	Probabilistic	297	Yes	Infant BF assessment tool	Cox proportional hazards analysis. Cox regression models
Montoya <i>et al</i> [24], 2020	Colombia	Observational	Convenience	52	Yes	Investigator-designed survey. Medical records	Descriptive analysis
Charpak and Montealegre-Pomar[25], 2023	Colombia	Observational	Convenience	57.154	Yes	Griffiths test. INFANIB test	Bivariate analysis
Sequeiros <i>et al</i> [26], 2023	Peru	Observational	Convenience	489	No	Demographic and family health survey. Household questionnaire. Individual woman questionnaire. Health questionnaire	Bivariate and multivariate analysis
Ortiz Romani and Loayza Alarico [20], 2023	Peru	Observational	Convenience	531	No	National database	Binary logistic regression
Wormald <i>et al</i> [19], 2021	Chile	Observational	Convenience	118	No	State trait anxiety inventory. Beck depression inventory; BDI-I. BF self-efficacy scale for mothers with hospitalized preterm infants	Multinomial logistic regression
Javela Rugeles <i>et al</i> [21], 2019	Colombia	Observational	Convenience	90	No	Medical records	Descriptive analysis
Mangialavori <i>et al</i> [22], 2022	Argentina	Observational	Probabilistic	1044	No	Investigator-designed survey. Medical records	Descriptive analysis
Ortelan <i>et al</i> [17], 2019	Brazil	Observational	Probabilistic	2112	Yes	Medical records	Multilevel Poisson regression models

LWB: Low birth weight; INFANIB: Infant neurological international battery; BDI-I: Beck depression inventory-I; BF: Breastfeeding.

to 58.5% at 6 months. The primary mediators of maintaining BF were educational level, access to health services, and social status[2,17-22]. Agudelo *et al*[23] conducted a randomized clinical trial on the effect of the time of initiation of skin-to-skin contact at birth, immediately compared to early, on the BF duration in term newborns, analyzing the percentage of infants exclusively breastfed at 3 months and the period in months of exclusive BF. The results showed that skin-to-skin contact, regardless of the initiation time, improved the percentage of exclusively breastfed infants in at-risk populations[23] (Table 2).

Individual characteristics related to self-efficacy for BF maintenance and adherence in low-birth-weight term infants in Latin America

Individual characteristics associated with BF maintenance in the study population were mainly related to maternal age and education, perception of BF success, type of birth, pathologies related to the newborn or mother, and previous BF experience. Some barriers to BF adherence were associated with the use of breast milk substitutes, advanced ages, separation of the mother-child dyad, and compromised emotional states of the mother. Facilitators for achieving self-efficacy levels were family and social support, maternal education and experience, and adequate follow-up of the mother's and newborn's health status by health services[2,17,19-26] (Table 3).

DISCUSSION

Low birth weight is a public health problem associated with a series of determinants that condition a child's health status in the short and long term, representing a challenge for the health system. This review identified the social and individual determinants in mothers who modify BF practices for its maintenance and adherence in an underexplored at-risk population.

Table 2 Sociodemographic characteristics and proximal determinants associated with breastfeeding outcomes in low-birth-weight term infants in Latin America

Ref.	BF results	Mother's socio-demographic characteristics			Associated proximate determinants
		Age	Education	Social stratum	
Lizarazo <i>et al</i> [2], 2023	Information on prenatal BF: 67%. No information on BF: 32.3%. 1-4 prenatal checkups: 43.5%. More than 4 controls: 13.7%. Time to initiation of BF at birth: < 1 h: 33.9%. 1-12 h: 33.1%. > 12 h: 33%. Previous history of BF. BF up to 6 months: 58.5%. BF between 3 and 6 months: 18.5%. No previous BF: 7.1%	Average 28 ± 7.3 years	High School: 38.7%. Technical education: 19.4%. Professional: 31.5%	Low stratum: 31.5%. Very low stratum: 40.3%	Work-related causes: 10.5%. Study: 0.8%. Partially absent mother: 0.8%
Ortelan <i>et al</i> [18], 2020	BF prevalence: 54.5%	Age in years (%). < 20: 18.1%. 20-35: 66.9%. > 35: 15%	High School: 47.1%. Professional: 12.5%	No report	Working outside the home (PR = 1.28; 95%CI 1.11-1.48). Residence in municipalities with a prevalence of child undernutrition below 10% (PR = 1.66; 95%CI 1.23-2.24). Mothers with 12 years of schooling or more (PR = 1.35; 95%CI 1.16-1.58)
Agudelo <i>et al</i> [23], 2021	Average duration of exclusive BF: 5 months. BF up to 3 months: 78%. No BF up to 3 months: 19.5%. BF up to 6 months: 25%. No BF up to 6 months: 71%	Median age (IQR). Intervention group: 23 years (21-29). Control group: 24 years (20-25)	Elementary education: 11%. High school: 60%. Technical education: 13%. Professional: 16%	Low stratum: 64.3%. Very low stratum: 33.6%	Working outside the home
Sequeiros <i>et al</i> [26], 2023	Interruption of exclusive BF: 26%. Initiation of BF at birth: Immediately: 70.1%. > 1 h: 29.8%	Age in years of mothers who discontinued BF. < 18: 31.7%. 18-25: 27.7%. 26-35: 25.7%. 36-45: 25.0%	Elementary education: 20.5%. High school: 26.7%. Professional: 31.2%	Low stratum: 22%. Middle stratum: 33%. High stratum: 36%	Higher educational level (PRa: 1.55; 95%CI: 1.06-2.27). Rich vs poor family wealth index (RPa: 1.13; 95%CI: 1.03-1.25). Residing in the jungle (RPa: 0.77; 95%CI: 0.71-0.84). Native indigenous language (PRa: 0.82; 95%CI: 0.75-0.91). BF training (PRa: 0.88; 95%CI: 0.82-0.94). Infant with health insurance (PRa: 0.91; 95%CI: 0.84-0.97)
Ortiz Romani and Loayza Alarico [20], 2023	Prevalence of early initiation of BF: 49.6%.	Age in years (%). 12-14: 0.09%. 15-19: 6.11%. 20-49: 93.80%	High School: 47.2%	Low stratum: 47%. Middle stratum: 21.3%. High stratum: 31.5%	Factors interfering with early initiation of BF: Living in rural area (ORa: 2.37) and jungle (ORa: 1.72). High wealth index. Access to health services and prenatal care
Javela Rugeles <i>et al</i> [21], 2019	Children with BF for one year maintain anthropometric measurements below -2 SD.	Age in years (%). < 20: 17%. > 35: 18%	High school: 64%. Elementary education: 18%. Technical education: 18%	Very low stratum: 57%. Low stratum: 36%. High stratum: 8%	Low social stratum
Mangialavori <i>et al</i> [22], 2022	Prevalence of BF: 34.7% (95%CI: 31.6-37.9). BF before the first hour of birth: 40.1% (95%CI: 36.9-43.4)	No report	Elementary education: 9.3%. High school: 91.3%	No report	Mother's educational level
Ortelan <i>et al</i> [17], 2019	Prevalence of BF: 43.9%	Age in years (%). < 20: 21.3%. 20-35: 65.3%. > 35: 13.4%	High School: 47.6%	No report	Factors favoring BF practices: Age between 20-35 years (PR = 1.35; 95%CI: 1.09-1.69). Work at home. Birth in BF-friendly hospital services. Increased availability of human milk banks per 10000 inhabitants

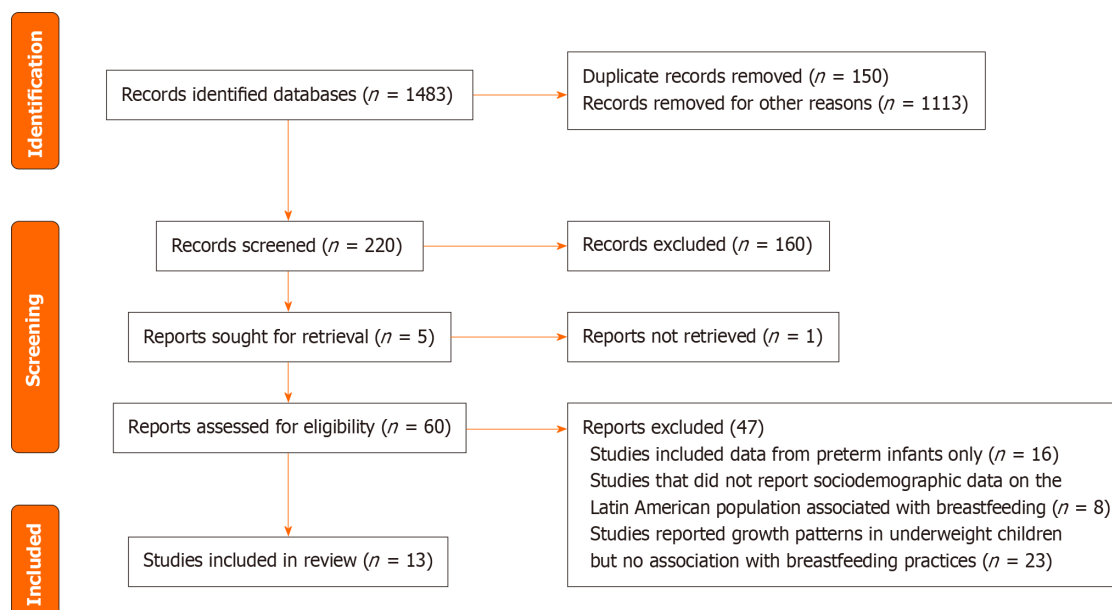
BF: Breastfeeding; PR: Prevalence radius; IQR: Interquartile range; OR: Odds ratio.

The study revealed that certain social factors hinder exclusive BF within the first 6 months of life. These factors contribute to the low BF rates in Latin America. Demographic factors such as advanced age, mainly in adolescence, low family income, ethnicity, marital status, support, and orientation of health services showed a direct relationship with feeding outcomes in the study population. Various studies have shown how social factors, such as marital status, impact

Table 3 Individual characteristics related to self-efficacy for breastfeeding maintenance and adherence in low-birth-weight term infants in Latin America

Ref.	Reason for BF desertion/difficulties	Barriers	Enablers
Lizarazo <i>et al</i> [2], 2023	Perception of low milk production. Newborn's feeling of not satiety. Newborn rejection. Maternal decision	Mother's mood as an influence on BF practice. Work commitments	Family support for housework
Ortelan <i>et al</i> [18], 2020	Age, education, multiparity	Inadequate supplementary feeding	High educational level
Agudelo <i>et al</i> [23], 2021	Supported to stimulate BF in the first hour of life	Interference with newborn routines; availability of time for skin-to-skin contact at birth; obesity; smoking	Educational support. Immediate skin-to-skin contact in the maternity ward
Montoya <i>et al</i> [24], 2020	Newborn hospitalization for low birth weight. Maternal hospitalization. BF technique. No previous experience in BF	Feeding with milk substitutes suggested by health personnel	Mother's willingness to breastfeed. Support from family and health personnel. Mother's previous BF experience
Charpak and Montealegre-Pomar[25], 2023	Respiratory pathology of the newborn	Pathologies of the newborn	Monitoring and follow-up of the health of low-birth-weight newborns and maternal care in mother Kangaroo programs.
Sequeiros <i>et al</i> [26], 2023	Lack of knowledge of BF during pregnancy	Mothers with higher education. Infant only child. Age < 18 years. Birth by caesarean section	Early BF training during pregnancy. Early initiation of BF
Ortiz Romani and Loayza Alarico [20], 2023	Cesarean delivery. First gestation. Pre-milk feeding of the newborn	Lack of BF skills. Limitations for skin-to-skin contact in the first hour of life	Develop skills and abilities in relation to the promotion of BF. Management of the mother's own symptoms that are contemplated in the different prenatal services and delivery room
Wormald <i>et al</i> [19], 2021	Manifestation of emotional symptoms	Exposure to triggers for depression or anxiety	Self-efficacy
Javela Rugeles <i>et al</i> [21], 2019	Newborn comorbidities	Extreme ages. No support during the first month of the newborn's life	Family support
Mangialavori <i>et al</i> [22], 2022	Cesarean delivery	Limitations to BF in the first hour of life. Separation of mother-infant dyad > 4 h	Educational level

BF: Breastfeeding.


Figure 1 The preferred reporting items for systematic reviews and meta-analyses flow diagram.

BF effectiveness. These factors are related to family stability and economic situations for child rearing and protection[27].

In this context, the educational level is an important factor. Studies report a greater tendency for early discontinuation of exclusive BF during the first hour up to 6 months of life in mothers with low educational levels with lower rates of BF in low-birth-weight infants compared with full-term infants with adequate weight for gestational age[28]. However, a pattern of BF abandonment is also observed in pregnant women with higher educational levels. BF policies focused on vulnerable populations and work activities specific to this educational level may explain this phenomenon; therefore, the needs of the people should be recognized in occupational terms and according to the economic growth of the regions[29].

Consequently, access to quality health services is essential. Our results showed positive effects in mothers who received education on the importance and benefits of BF during follow-up, maternal perinatal care, and newborn hospitalization. Intervention strategies based on population needs and geographic diversity by analyzing the social structure's multiple components can significantly promote BF adherence and maintenance in the study population[30]. However, these intervention processes should be accompanied by the joint construction of skills to develop self-efficacy to minimize the risk of abandonment of good feeding practices in the infant population[31]. Additionally, conditions of the newborn and mother related to the manifestation of pathologies should be considered to strengthen the response capacity and BF technique during the healthcare process to ensure adherence to hospital discharge[27,32].

In this sense, family and health personnel support are essential for the mother to make the right decisions regarding BF. The early diagnosis of risk factors associated with individual characteristics can become a protective factor that contributes to the management of deficient emotional states and, by extension, positively stimulates confidence and security skills to continue BF[33]. In addition, involving parents in the orientation process for BF techniques and encouraging active participation helps foster positive outcomes for the couple. BF self-efficacy in low-birth-weight infants is considered an emotional factor that influences milk production and prolongs BF exclusivity and maintenance, enabling empowerment in the BF process to overcome obstacles and difficulties for comprehensive care[33]. Implementing health interventions on the overall care of low-birth-weight newborns at home from a skilled approach allows interaction in health management with the child. Therefore, mothers' self-efficacies should be assessed to detect the risk of BF abandonment and facilitate a safe transition based on the population's needs[34].

CONCLUSION

Diagnosing the proximal determinants that mediate BF adherence and maintenance using a differential approach and a self-efficacy skills development perspective is essential for the comprehensive care of low-birth-weight term infants in developing countries.

ARTICLE HIGHLIGHTS

Research background

Proximal determinants define the maintenance of breastfeeding (BF) in infants with low birth weights in the Latin American population.

Research motivation

Equity in health is an essential issue to address to achieve sustainable development goals regarding the food security of the population at risk.

Research objectives

To identify proximal determinants associated with BF maintenance in low birth weight infants at term. Little literature describes how proximal determinants affect BF maintenance in populations at nutritional risk. Determining the epigenetic conditions involved in infant feeding practices is essential to develop good health practices.

Research methods

A scoping review was performed according to the five phases proposed and reporting according to the preferred reporting items for systematic reviews for systematic reviews and meta-analyses statement.

Research results

Proximal determinants related to social position are involved in the maintenance of BF in population at nutritional risk. Despite the fact that BF is considered the best food for the population at nutritional risk, the prevalence at a global level does not allow achieving sustainable development objectives. Individual factors and self-management skills should be promoted to reinforce infant feeding practices.

Research conclusions

The analysis of social inequalities is fundamental to reduce the gaps in the provision of health services. A comprehensive approach with a differential emphasis based on individual and collective response capacity is a priority for the formulation of public health policies.

Research perspectives

To analyze individual and collective differences based on the epidemiological behavior of possible nutritional affectations in the population at risk. Develop public policies based on evidence-based medicine and on the needs perceived by the population.

FOOTNOTES

Author contributions: Avendaño-Vásquez CJ; Villamizar-Osorio ML; and Niño-Peñaranda CJ contributed to this paper with conception and design, literature review and analysis, manuscript drafting, critical revision, and editing, and approval of the final version; Medellín-Olaya J; and Reina-Gamba NC contributed to this study with conception and design, editing, and approval of the final version.

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