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

Carlos Javier Avendaño-Vásquez, Magda Liliana Villamizar-Osorio, Claudia Jazmin Niño-Peñaranda, Judith Medellín-Olaya, Nadia Carolina Reina-Gamba

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 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%
to 58.5% at 6 months. The primary mediators of maintaining BF were educational level, access to health services, and social status. Agudelo et al. 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 (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. (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.
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

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Reason for BF desertion/difficulties</th>
<th>Barriers</th>
<th>Enablers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ortelan et al[18], 2020</td>
<td>Age, education, multiparity</td>
<td>Inadequate supplementary feeding</td>
<td>High educational level</td>
</tr>
<tr>
<td>Agudelo et al[23], 2021</td>
<td>Supported to stimulate BF in the first hour of life</td>
<td>Interference with newborn routines; availability of time for skin-to-skin contact at birth; obesity; smoking</td>
<td>Educational support. Immediate skin-to-skin contact in the maternity ward</td>
</tr>
<tr>
<td>Montoya et al[24], 2020</td>
<td>Newborn hospitalization for low birth weight. Maternal hospitalization. BF technique. No previous experience in BF</td>
<td>Feeding with milk substitutes suggested by health personnel</td>
<td>Mother's willingness to breastfeed. Support from family and health personnel. Mother's previous BF experience</td>
</tr>
<tr>
<td>Charpak and Montealegre-Pomar[25], 2023</td>
<td>Respiratory pathology of the newborn</td>
<td>Pathologies of the newborn</td>
<td>Monitoring and follow-up of the health of low-birth-weight newborns and maternal care in mother Kangaroo programs.</td>
</tr>
<tr>
<td>Sequeiros et al[26], 2023</td>
<td>Lack of knowledge of BF during pregnancy</td>
<td>Mothers with higher education. Infant only child. Age &lt; 18 years. Birth by caesarean section</td>
<td>Early BF training during pregnancy. Early initiation of BF</td>
</tr>
<tr>
<td>Ortiz Romaní and Loayza Alarico[20], 2023</td>
<td>Cesarean delivery. First gestation. Pre-milk feeding of the newborn</td>
<td>Lack of BF skills. Limitations for skin-to-skin contact in the first hour of life</td>
<td>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</td>
</tr>
<tr>
<td>Wormald et al[19], 2021</td>
<td>Manifestation of emotional symptoms</td>
<td>Exposure to triggers for depression or anxiety</td>
<td>Self-efficacy</td>
</tr>
<tr>
<td>Javela Rugeles et al[21], 2019</td>
<td>Newborn comorbidities</td>
<td>Family support</td>
<td></td>
</tr>
<tr>
<td>Mangialavori et al[22], 2022</td>
<td>Cesarean delivery</td>
<td>Limitations to BF in the first hour of life. Separation of mother-infant dyad &gt; 4 h</td>
<td>Educational level</td>
</tr>
</tbody>
</table>

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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