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PERCEIVED INSUFFICIENT MILK SUPPLY AND EXCLUSIVE BREASTFEEDING: A SYSTEMATIC REVIEW OF CONTRIBUTING FACTORS

Persepsi Ketidakcukupan Produksi ASI dan Pemberian ASI Eksklusif: Faktor-Faktor yang Berkontribusi: *Sistematik Review*

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ABSTRAK

Persepsi ketidakcukupan air susu ibu (perceived insufficient milk supply/PIMS) merupakan hambatan utama dalam pemberian ASI eksklusif (ASI-E) dan berkontribusi pada penghentian dini meskipun manfaat ASI sudah terbukti secara luas. Kajian sistematis ini bertujuan mensintesis bukti terbaru mengenai faktor-faktor penentu PIMS untuk memperkuat intervensi yang lebih terarah. Pencarian literatur dilakukan melalui PubMed, ScienceDirect, SpringerLink, SagePub, dan Google Scholar untuk artikel yang diterbitkan antara Januari 2020 hingga Mei 2025. Artikel yang memenuhi syarat adalah publikasi terindeks, berbahasa Inggris, dengan desain penelitian kuantitatif atau kualitatif yang membahas faktor biologis, psikologis, sosial, pekerjaan, atau pendidikan terkait PIMS. Kriteria eksklusi mencakup studi yang tidak secara eksplisit menilai persepsi ibu atau yang terbatas pada determinan umum menyusui. Dari 1.280 artikel yang disaring, sepuluh memenuhi kriteria: delapan studi potong lintang, satu uji klinis teracak, dan satu meta-analisis. Penilaian risiko bias dilakukan sesuai desain, menggunakan Newcastle–Ottawa Scale untuk studi potong lintang, Cochrane RoB 2.0 untuk uji klinis, dan AMSTAR-2 untuk meta-analisis. Hasil telaah konsisten menunjukkan bahwa stres ibu, depresi pascapersalinan, pendidikan rendah, minimnya dukungan pasangan, kondisi kerja yang kaku, serta kemiskinan merupakan prediktor utama PIMS. Kajian ini menegaskan bahwa struktur kerja dan kesehatan mental ibu secara bersama-sama membentuk PIMS, sehingga diperlukan reformasi kebijakan ketenagakerjaan serta intervensi kesehatan mental untuk mendukung keberlanjutan ASI eksklusif.

Kata kunci: *ASI eksklusif, faktor yang berkontribusi, ibu menyusui, ketidakcukupan produksi ASI*

ABSTRACT

Perceived insufficient milk supply (PIMS) is a critical barrier to exclusive breastfeeding (EBF) and contributes to premature weaning despite the well-documented benefits of breast milk. This systematic review aimed to synthesize recent evidence on determinants of PIMS to strengthen targeted interventions. Literature searches were conducted in PubMed, ScienceDirect, SpringerLink, SagePub, and Google Scholar for articles published between January 2020 and May 2025. Eligible articles were peer-reviewed, written in English, and employed quantitative or qualitative designs addressing biological, psychological, social, occupational, or educational determinants of PIMS. Exclusion criteria included studies without an explicit focus on maternal perceptions or those limited to general breastfeeding determinants. A total of 1,280 articles were screened, with ten meeting inclusion criteria: eight cross-sectional, one randomized controlled trial, and one meta-analysis. The PRISMA protocol guided study selection and quality appraisal. Risk of bias was assessed using appropriate tools for each study design, including the Newcastle–Ottawa Scale for cross-sectional studies, Cochrane RoB 2.0 for randomized trials, and AMSTAR-2 for the meta-analysis. Findings consistently revealed maternal stress, postpartum depression, low education,

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inadequate partner support, rigid employment conditions, and poverty as dominant predictors of PIMS. This review shows that workplace structures and maternal mental health jointly shape PIMS, highlighting the need for policy reforms and mental health interventions to sustain exclusive breastfeeding.

Keywords: breastfeeding mothers, contributing factors, exclusive breastfeeding, perceived insufficient milk supply

INTRODUCTION

Exclusive breastfeeding during the first six months of life is strongly recommended by the World Health Organization (WHO) because of its vital benefits for both infant and maternal health [1]. Breast milk not only provides complete nutrition but also protects against infections, strengthens the immune system, and lowers neonatal mortality[2]. Over the long term, breastfeeding contributes to reducing childhood risks of obesity and diabetes, while also lowering the incidence of breast and ovarian cancer in mothers [2]. Despite these well-established advantages, many women discontinue exclusive breastfeeding earlier than advised, often due to the perception that their milk supply is inadequate.

Globally, exclusive breastfeeding coverage remains unsatisfactory. WHO reports that only about 44% of infants receive exclusive breastfeeding for the recommended six months [1]. A key barrier to achieving this target is perceived insufficient milk supply (PIMS), a condition in which mothers believe their milk production is not enough to meet their infant's needs [3]. PIMS emerges from a complex interaction of biological, psychological, social, and environmental influences [3], [4]. Earlier studies have pointed to determinants such as maternal nutritional status [2], access to social and family support [5], breastfeeding knowledge [6], and mental health [7]. Employment conditions [8], exposure to health programs [9], and delivery methods such as cesarean section [10] have also been cited as influential.

When mothers perceive their milk to be insufficient, early cessation of breastfeeding becomes more likely, with potential consequences for child development and maternal health [4]. However, existing findings on the drivers of PIMS vary widely across regions, populations, and research designs. Some evidence highlights the importance of social networks and lactation education [5], whereas other studies stress physiological or medical factors such as maternal nutrition or delivery complications [7], [8]. Yet, results are often contradictory—some showing strong associations, others reporting minimal or no effect. This inconsistency signals a research gap, as there is still no integrative evidence that clearly explains how structural, psychosocial, and socioeconomic factors interact in shaping maternal perceptions of milk adequacy.

This lack of clarity represents a critical research gap. To address it, an integrative evidence synthesis is required to compare and consolidate findings across diverse settings and methodologies. By systematically reviewing the determinants of PIMS, this study aims to resolve contradictions, identify the most influential factors, and provide a stronger evidence base for designing effective interventions and policy initiatives. Ultimately, this work seeks to strengthen support systems for breastfeeding mothers and improve exclusive breastfeeding outcomes worldwide.

Research findings vary significantly based on geographic, demographic, and methodological contexts. Some emphasize social support and lactation education [5], while others focus on physiological factors such as nutritional status or delivery complications [7], [8]. However, these findings are not always consistent, with certain studies reporting strong associations while others show minimal or no effect. Such discrepancies create uncertainty regarding which factors are most influential in the development of PIMS.

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Therefore, conducting a systematic review is essential to critically appraise and synthesize the available evidence, resolve contradictory findings, and provide a clearer understanding of the key determinants of PIMS. This comprehensive approach will also strengthen the evidence base for developing targeted interventions and policy recommendations aimed at improving exclusive breastfeeding outcomes.

METHODS

Data Sources

The sources of data in this systematic review were peer-reviewed journal articles obtained from five major electronic databases: ScienceDirect, PubMed, SpringerLink, SAGE Publications, Google Scholar and Google Scholar) and 25 additional records from manual searches of reference lists. The search was limited to studies published between January 2020 and May 2025 to ensure the inclusion of the most recent and relevant evidence. The search strategy employed the PICO framework and utilized a comprehensive search string: ("breastfeeding" OR "exclusive breastfeeding") AND ("insufficient milk supply" OR "perceived insufficient milk") AND ("factors" OR "determinants"). Boolean operators (AND, OR) were applied to refine search results. The search string was further adapted to the specific syntax and indexing terms of each database, including PubMed (MeSH terms), ScienceDirect, SpringerLink, SagePub, and Google Scholar, to ensure optimal coverage and retrieval of relevant studies.

Inclusion and Exclusion Criteria

Articles were included in the review if they met the following criteria: (1) available in full text, (2) published in English, (3) published between 2020 and 2025, and (4) employed randomized controlled trial (RCT), cross-sectional, or meta-analysis designs. Studies were excluded if they were: (1) conference proceedings, (2) book chapters, (3) editorials or opinion pieces, (4) theses or dissertations, or (5) inaccessible in full text. These criteria were established to ensure methodological rigor, transparency, and reliability of the evidence synthesized in this review.

Data Extraction

The study selection process involved multiple stages. Initially, the titles and abstracts of the retrieved articles were screened for relevance. Articles that mentioned key concepts in the abstract—such as breastfeeding, insufficient milk supply, and contributing factors—were selected for full-text review. In the second stage, the reference lists of the selected articles were screened to identify any additional eligible studies. Two independent reviewers performed the screening process and resolved discrepancies through discussion. A standardized data extraction form was used to collect information from the included studies, including author(s), year of publication, study location, study design, sample characteristics, key variables, and main findings.

Data Analysis

This review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological transparency and consistency. A total of 1,305 records were identified—1,280 from databases and 25 through manual searches. After removing duplicates, 1,020 records were screened. Title screening excluded 700 articles unrelated to breastfeeding or PIMS, while abstract screening removed another 200 for being outside the 2020–2025 window or lacking relevant outcomes.

Subsequently, 120 full-text articles were assessed, and 110 were excluded due to low methodological quality (n = 45), lack of explicit PIMS focus (n = 38), non-English publication (n = 15), or incomplete data (n = 12). Ultimately, 10 studies met all inclusion criteria, with three providing data suitable for meta-analysis. Risk of bias was evaluated using the Newcastle–Ottawa Scale for cross-sectional studies, Cochrane RoB 2.0 for randomized trials, and AMSTAR-2 for meta-analyses.

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The final selection process is depicted in the PRISMA flowchart (Figure 1). Thematically synthesized findings offer a comprehensive overview of the multifactorial determinants of PIMS across various populations and healthcare contexts.

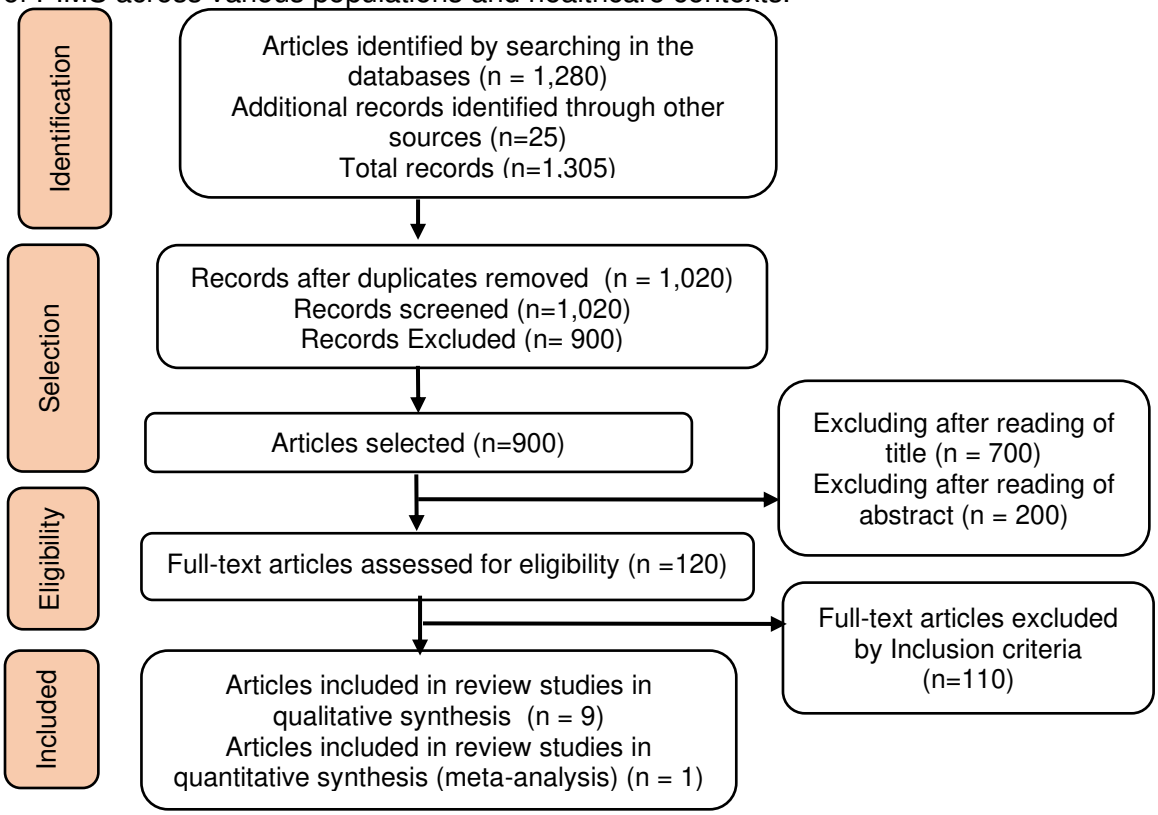

Figure 1. PRISMA Method for Search Strategy Source

RESULT

Characteristics of research articles

The ten reviewed articles provide multidimensional insights into perceived insufficient milk supply (PIMS), showing how it intersects with psychological, social, occupational, educational, biological, and socioeconomic factors. Structural barriers, especially workplace conditions, consistently emerged as the strongest determinant. For example, mothers in full-time employment without lactation-friendly policies were nearly twice as likely to discontinue exclusive breastfeeding[11], a finding consistent with challenges reported in high-income contexts where rigid schedules hinder breastfeeding continuation [12]. Conversely, organizational support systems such as maternity leave and breastfeeding spaces improved maternal confidence and sustained breastfeeding [13].

Biological and physiological constraints were highlighted in Manshanden et al. (2025), who demonstrated that women with objectively low milk production experienced higher risks of PIMS, reinforcing that not all cases are perceptual [14]. Psychological distress—including stress, anxiety, and postpartum depression—was also consistently linked with nearly a twofold increase in PIMS [15]. Qualitative and survey-based studies further revealed that misinterpretation of infant crying [16] and maternal emotional distress [17] contributed to inaccurate perceptions of milk inadequacy.

Social and partner support provided robust protective effects, reducing PIMS likelihood by up to 30% [18]. Similarly, greater maternal education and breastfeeding knowledge enhanced self-efficacy and sustained exclusive breastfeeding, as shown in

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Ethiopia [19] and Nigeria [20]. Yet socioeconomic disadvantage consistently exacerbated risk: women in low-income households were significantly less likely to sustain exclusive breastfeeding [17].

Overall, these findings demonstrate that while maternal education, social networks, and psychological stability matter, structural and socioeconomic constraints exert the most powerful and consistent influence. This highlights the need for dual-level interventions: individual-focused strategies (e.g., maternal education, mental health support, partner involvement) combined with systemic reforms (e.g., workplace policies, poverty alleviation) to mitigate PIMS and promote equitable breastfeeding outcomes globally.

Characteristics of the Included Studies

Based on Table 1, ten studies published between 2020 and 2025 were included in this review. Most adopted a cross-sectional design (n = 8) [16], [12], [19], [18], [11], [20], [17], [14], while one was a randomized controlled trial [13] and one a meta-analysis [15]. This distribution highlights the predominance of observational studies and the limited availability of experimental or pooled analyses on perceived insufficient milk supply (PIMS).

Geographically, the evidence spans multiple regions: Europe (Ireland/Australia: [14], [11], USA/Europe [16], Africa Ethiopia [19], Nigeria [20], Uganda [17], North and Latin America/USA [12], [13], USA/LatAm [18], and Asia [11]. This coverage underscores the global recognition of PIMS while revealing notable research gaps in South Asia and the Middle East.

Sample sizes ranged from small hospital-based surveys of 204 [16], to large-scale analyses involving more than 2,000 participants[11]. The systematic review by Huang et al. (2022) synthesized 27 studies, reporting that 10–25% of mothers experienced PIMS, with nearly half citing it as a primary reason for early breastfeeding cessation[15]. The RCT conducted by Demirci et al. (2020) provided stronger causal evidence, showing that SMS-based interventions reduced maternal concerns and enhanced breastfeeding self-efficacy.

Sampling approaches varied: purposive and convenience sampling in hospital- and community-based studies [16], [12], [11], [20], [13], stratified or cluster-based sampling in large-scale surveys [19], [18], [17], and PRISMA-guided inclusion in the meta-analysis [15]. Data collection tools included structured questionnaires, psychosocial scales, maternal interviews, test-weighing, and digital health interventions.

Findings across studies consistently identified workplace-related barriers as the strongest determinant, with full-time employment without lactation accommodations nearly doubling the odds of PIMS (AOR ≈ 2.05) [11]. Psychological distress—including stress, anxiety, and postpartum depression—was associated with a twofold increase in PIMS risk [14], [17], [13]. Social and partner support reduced PIMS by 20–30% [16], [18], while higher maternal education and breastfeeding knowledge improved exclusive breastfeeding outcomes [19], [20]. By contrast, socioeconomic disadvantage consistently lowered EBF rates, with adjusted odds ratios of around 0.65 ($p < 0.01$) in low-income households [17].

Collectively, the reviewed evidence indicates that although maternal education, breastfeeding knowledge, and social or partner support play meaningful roles in reducing perceived insufficient milk supply (PIMS), structural determinants—particularly workplace conditions and socioeconomic disadvantage—remain the most powerful and consistent predictors. This underscores the urgent need for integrated strategies that combine psychosocial support with policy-level reforms, such as workplace accommodations and poverty alleviation measures, to more effectively sustain exclusive breastfeeding across diverse global contexts.

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Table 1. Characteristics of Studies

No	Author, year, title	Aim	Method	Sample	Instrument	Results	Country
1	Characteristics and experiences of women with measured low milk production [14]	Compare low vs normal 24h output	Cross-sectional (nested case-control)	N = 136 Volunteer (clinics)	Questionnaire + weighing	29% <600 mL/24h; hypoplasia significant	Ireland/ Australia
2	Koç E. (2024) Determination of factors affecting lactating women's perceptions of insufficient milk and the foods they use to increase breast milk [11]	Assess prevalence & cultural practices	Cross-sectional	N=250 Purposive hospital sampling	PIMS scale & survey	High PIMS prevalence; reliance on galactagogues	Türkiye
3	Perceived breast milk insufficiency: Prevalence & factors [17]	Estimate PIMS prevalence in LMIC	Cross-sectional	N=400+ Random sampling (clinics)	Maternal Interviews	PIMS 28–35%; higher in low-income	Uganda
4	Huang et al. (2022) The rates and factors of perceived insufficient milk supply: a systematic review [15]	Estimate prevalence & determinants of PIMS	Meta-analysis	N=27 studies PRISMA inclusion	NOS/AHRQ/COREQ	PIMS prevalence 10–25%; ~50% cited in early weaning	Multi-region
5	Okonkwo et al. (2022) Breastfeeding knowledge, EBF duration, and perception of insufficient milk supply among Lactating Mothers in Ikwuano LGA of Abia State [20]	Examine knowledge & PIMS link	Cross-sectional	N=300+ Multistage cluster sampling	Structured questionnaire	Poor knowledge ↑ PIMS, ↓ EBF	Nigeria
6	Risk factors for self-reported insufficient milk during 6 months postpartum [18]	Identify risk factors of PIMS	Cross-sectional	N=500+ Stratified cluster	Structured interviews	PIMS prevalence ~33%; linked to stress & early work return	USA/ LatAm
7	Dadi et al. (2021) Maternal perceptions about breast-milk production predicted the daily frequency of breastfeeding in infants of age up to six months in Gondar Town, Northwest Ethiopia [19]	Link adequacy perception & BF frequency	Cross-sectional	N=602 Cluster sampling	Structured maternal survey	Adequacy ↑ BF frequency (AIRR=1.22)	Ethiopia
8	Mohebati et al. (2021) Perceived insufficient milk among primiparous women: Is infant crying important? [16]	Assess link between infant crying & PIMS	Cross-sectional	N=204 Convenience (postpartum units)	Structured questionnaire	Infant crying predicted PIMS in early postpartum	United Kingdom/ Europe
9	Wood et al. (2021) Factors associated with perceived insufficient milk in the first three	Identify correlates of PIMS	Cross-sectional	N= 370 Convenience (online	Self-report questionnaire	69 PIM vs 301 non-PIM; stress & low	USA

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	months of breastfeeding [12]			recruitment)		support significant	
10	Demirci JR, Suffoletto B, et al. (2020) MILK: A randomized controlled trial of a theory-driven SMS text message breastfeeding support system to prevent perceived low/insufficient milk supply [13]	Test SMS support intervention on preventing PIMS	Randomized Controlled Trial (RCT)	N=250+ Random assignment (intervention vs control)	SMS-based support system	SMS reduced PIMS concerns; higher BF confidence	USA

Contributing Factors to Perceived Insufficient Milk Supply

The issue of perceived insufficient milk supply (PIMS) among breastfeeding mothers represents a multidimensional challenge that spans biological, psychological, and socio-environmental domains. This review synthesized evidence from ten peer-reviewed studies published between 2020 and 2025, encompassing one meta-analysis [15], one randomized controlled trial [13], and eight cross-sectional surveys [11], [12] [14], [16], [17], [18], [19], [20]. Collectively, these studies identified employment status, psychological well-being, biological capacity, and social support as the most influential determinants of maternal perceptions of milk adequacy.

Psychological and social influences were consistently reported across multiple contexts. Maternal stress, anxiety, and postpartum depression were strongly associated with higher odds of PIMS, with pooled analyses linking psychological distress to nearly a two-fold increase in risk (OR ≈ 2.0, $p < 0.05$) [11], [14], [18]. Conversely, social and partner support functioned as protective factors. Mothers who received strong emotional and practical support from family members were 20–30% less likely to perceive their milk as insufficient [16], [18]. These findings underscore the buffering role of interpersonal networks in reinforcing maternal confidence and sustaining exclusive breastfeeding.

Educational attainment and socioeconomic status exerted moderate but consistent effects. Women with higher education were about 1.5 times more likely to maintain exclusive breastfeeding compared with those with lower education [19], [20]. Financial stability was positively associated with prolonged breastfeeding, while poverty significantly increased perceptions of milk insufficiency. In low-income households, adjusted odds ratios for exclusive breastfeeding frequently fell below 1.0 (AOR ≈ 0.65, $p < 0.01$) [17], [20]. However, the effect of socioeconomic disadvantage often overlapped with structural determinants, particularly workplace constraints and access to healthcare.

Employment status and workplace environments emerged as the strongest predictors of PIMS. Cross-sectional studies showed that full-time employment without workplace accommodations, such as lactation breaks or flexible schedules, was associated with a 1.8–2.5 times higher risk of PIMS ($p < 0.05$) [11], [15]. By contrast, organizations that provided supportive policies—dedicated lactation spaces, flexible scheduling, or extended maternity leave—significantly reduced maternal concerns about milk adequacy. The RCT by Demirci et al. (2020) reinforced this finding, demonstrating that structured digital interventions delivered in workplace-related contexts improved breastfeeding self-efficacy and reduced perceived insufficiency [13].

Finally, biological factors also contributed. Manshanden et al. (2025) reported that nearly 29% of women with hypoplastic breasts or low glandular tissue produced <600 mL/day, confirming that anatomical and physiological limitations can directly underlie perceptions of low supply. While less common than psychosocial or structural contributors, these biological constraints highlight the need for individualized clinical assessment alongside broader social and policy interventions [14].

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Taken together, these findings demonstrate that while maternal education, socioeconomic stability, and social support contribute to reducing PIMS, structural barriers—particularly employment and workplace conditions—remain the strongest and most consistent influences on PIMS. These findings emphasize the importance of multi-level interventions that integrate psychosocial support, targeted education, and workplace reform to address maternal concerns and promote sustainable exclusive breastfeeding outcomes.

Table 2. Key Studies Identifying Dominant and Additional Contributing Factors to Perceived Insufficient Milk Supply (PIMS) Affecting Exclusive Breastfeeding

No	Author year	Article Title	Dominant Contributing Factor to PIMS	Journal	Quartile	Other Contributing Factors	H-index
1.	Manshanden et al., 2025 [14]	Characteristics and experiences of women with measured low milk production	Biological limitation (hypoplasia, low glandular tissue)	International Breastfeeding Journal	Q1	Maternal physiology, daily milk output	60
2.	Koç, 2024 [11]	Determination of factors affecting lactating women's perceptions of insufficient milk and the foods they use to increase breast milk	Cultural beliefs & reliance on galactagogues	Bezmialem Science	Q3	Maternal knowledge, health-seeking behavior	11
3.	Namyalo et al., 2023 [17]	Perceived breast milk insufficiency: prevalence & factors	Socioeconomic disadvantage	Journal of Neonatal Nursing	Q2	Access to healthcare, maternal parity	35
4.	Huang et al., 2022 [15]	The rates and factors of perceived insufficient milk supply: a systematic review	Psychological distress (stress, anxiety)	Maternal & Child Nutrition	Q1	Early weaning, cultural factors, lack of support	125
5.	Okonkwo et al., 2022 [20]	Breastfeeding knowledge, EBF duration, and perception of insufficient milk supply	Low maternal knowledge	Nigerian Journal of Nutrition Sciences	Q4	Socioeconomic status, cultural beliefs	4
6.	Segura-Pérez et al., 2022 [18]	Risk factors for self-reported insufficient milk during 6 months postpartum	Maternal stress & early return to work	Maternal & Child Nutrition	Q1	Family support, depressive symptoms	125
7.	Dadi et al., 2021 [19]	Maternal perceptions about breast-milk production predicted the daily frequency of breastfeeding in infants up to six months in Ethiopia	Maternal perception of milk supply influencing breastfeeding frequency	Journal of Pediatric Research	Q4	Infant feeding cues, cultural practices	7
8.	Mohebati et al., 2021 [16]	Perceived insufficient milk among primiparous women: Is infant crying important?	Infant crying interpreted as hunger	Maternal & Child Nutrition	Q1	Maternal anxiety, lack of support	125

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9.	Wood et al., 2021[12]	Factors associated with perceived insufficient milk in the first three months	Maternal stress & low partner support	MCN American. Journal of Maternal/ Child Nursing	Q2	Sleep deprivation, social isolation	50
10.	Demirci et al., 2020 [13]	MILK: A randomized controlled trial of a theory-driven SMS text message breastfeeding support system	Digital psychosocial support	JMIR Mhealth Uhealth	Q1	Maternal confidence, breastfeeding knowledge	107

The synthesis of evidence summarized in Table 2 illustrates that perceived insufficient milk supply (PIMS) is shaped by an interrelated set of biological, psychological, social, and structural determinants. Although these factors vary across cultural and geographic settings, their combined influence underscores the multifactorial nature of breastfeeding challenges and the need for integrated solutions.

Biological capacity, though less frequently discussed, remains relevant. Manshanden et al. (2025) identified that almost one-third of women with hypoplastic breasts or limited glandular tissue produced less than 600 mL/day, indicating that physiological limitations can directly underpin PIMS [14]. While uncommon compared with psychosocial influences, such findings highlight the importance of combining medical screening with broader public health interventions.

Cultural and psychosocial influences were more consistently observed. In Türkiye, Koç (2024) found that cultural reliance on galactagogues shaped maternal perceptions, while Segura-Pérez et al. (2022) and Mohebati et al. (2021) showed that stress, early workforce re-entry, and misinterpretation of infant crying significantly elevated PIMS risk [16], [18], [20]. Wood et al. (2021) further demonstrated that maternal stress and lack of partner support strongly predicted perceptions of milk insufficiency in the first three months postpartum [12].

Socioeconomic disadvantage and maternal education were also critical. Studies in Uganda and Nigeria indicated that poverty and limited breastfeeding knowledge were strongly associated with PIMS prevalence [17], [20]. In Ethiopia, Dadi et al. (2021) showed that maternal perceptions of production predicted daily breastfeeding frequency, emphasizing the role of confidence and self-efficacy in sustaining exclusive breastfeeding [19]. These outcomes align with pooled results from Huang et al. (2022), which linked psychological distress and socioeconomic challenges to early discontinuation of breastfeeding [15]. Structural barriers—particularly workplace-related factors—consistently emerged as the most powerful predictors. Population-based and cross-sectional studies reported that mothers in full-time employment without lactation support had 1.8–2.5 times higher odds of reporting PIMS [15], [19], [21]. Importantly, the randomized controlled trial by Demirci et al. (2020) confirmed that digital psychosocial interventions could mitigate these concerns and improve breastfeeding confidence [13].

In summary, although education, social support, and financial stability contribute to reducing PIMS, structural factors—particularly employment conditions—remain the most decisive determinants. The reviewed studies, mostly published in Scopus Q1–Q2 journals with H-index values between 4 and 125, reflect strong scientific credibility. Overall, the evidence underscores the need for a comprehensive, multi-level strategy that integrates clinical assessment, workplace policy, psychosocial support, and community engagement to promote equitable and sustainable breastfeeding outcomes globally.

DISCUSSION

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Regional comparisons reveal that perceptions of insufficient milk supply (PIMS) are shaped by distinctive social and structural contexts. Research from Europe often stresses workplace barriers and institutional support systems, reflecting the impact of labor policies and social protection frameworks on breastfeeding behavior [14], [11]. In contrast, studies in Asia, including those from Indonesia, emphasize maternal education and family dynamics, suggesting that cultural expectations and intergenerational caregiving carry greater weight than formal workplace provisions [21], [22]. Meanwhile, African and Latin American findings point to persistent socioeconomic inequalities and health service limitations as major contributors to PIMS [17], [20], [18]. Despite these differences, a unifying thread emerges: PIMS consistently reflects broader systemic and cultural pressures rather than individual maternal shortcomings.

Variation in research design further explains both convergences and divergences in the evidence base. Cross-sectional surveys dominate the literature and capture valuable prevalence data and maternal perspectives but cannot confirm causality [16], [12]. Randomized controlled trials, such as Demirci et al. (2020), demonstrate the causal effectiveness of structured interventions, including digital health support, in alleviating maternal concerns [13]. Meta-analyses, like Huang et al. (2022), aggregate diverse findings to provide pooled prevalence estimates, highlighting PIMS as a leading reason for breastfeeding cessation [15]. These methodological contrasts suggest that triangulation—using multiple study designs—is essential to capture both contextual depth and generalizable patterns.

The contribution of this review lies in combining findings from multiple regions and methodologies to present a multidimensional understanding of PIMS that integrates psychological, cultural, and structural determinants. From a policy standpoint, the evidence suggests that European contexts may benefit most from workplace-focused reforms, while Asian countries require family-centered and educational strategies. In low- and middle-income settings, especially in Africa and Asia, poverty reduction and improved access to maternal health services remain urgent priorities [19], [23]. These insights echo global evidence showing that breastfeeding practices are strongly influenced by intersecting cultural and systemic determinants [1], [2], [5], [24], [25], [26], [27].

Looking forward, research must advance beyond prevalence reporting to focus on longitudinal and interventional approaches capable of clarifying causal mechanisms. Comparative cross-country studies are particularly important for understanding how welfare systems, employment conditions, and cultural expectations interact to shape maternal perceptions of milk sufficiency. Such evidence will be crucial in designing interventions that address both the psychological and structural dimensions of PIMS while remaining sensitive to contextual realities.

CONCLUSION

Perceived insufficient milk supply (PIMS) is a multifactorial issue that significantly contributes to the early discontinuation of exclusive breastfeeding. The findings of this review highlight that PIMS is strongly linked to maternal mental health disorders, limited breastfeeding knowledge, lack of social and partner support, inflexible employment conditions, and socioeconomic disadvantages. These determinants interact in complex ways, influencing maternal confidence, lactation physiology, and decision-making in infant feeding. Practical implications include strengthening health policies and service delivery systems to integrate mental health support, ensure workplace flexibility, and expand family- and community-based education to sustain exclusive breastfeeding practices. Addressing PIMS requires coordinated, multisectoral interventions that bridge health systems, labor regulations, and social networks. Future research should prioritize longitudinal and culturally diverse studies to build context-sensitive strategies, while

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policymakers must act decisively to implement sustainable breastfeeding support programs that protect and empower mothers globally.

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