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SYSTEMATIC REVIEW

Key Factors and Practices Shaping Lactating Mothers' Use of Lactogenic Agents for Infant Health: A Nursing Perspective in Saudi Arabia and Arab Countries

Factores y prácticas clave que influyen en el uso de agentes lactogénicos por madres lactantes para la salud infantil: una perspectiva de enfermería en Arabia Saudita y países árabes

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ABSTRACT

Introduction: lactogenic agents are used by breastfeeding mothers in Saudi Arabia to enhance milk production, influenced by maternal knowledge, cultural practices, family advice, and professional guidance. Evidence on their use and outcomes is limited.
Objective: to explore factors affecting lactogenic agent use and the role of nursing support in promoting safe, effective lactation practices in Saudi Arabia and Arab countries.
Method: a systematic search following PRISMA 2020 guidelines was conducted in PubMed, Scopus, Web of Science, CINAHL, Cochrane Library, IMEMR, and Arab World Research Source for studies from 2000 to March 2025. Cross-sectional, cohort, quasi-experimental, and mixed-methods studies were included. Data extraction and quality appraisal were independently performed by two reviewers.
Results: thirteen studies involving ~4200 mothers aged 18–40 years were included. Exclusive breastfeeding at six months ranged from 20–42 %. Herbal galactagogues, mainly fenugreek, anise, and black seed, were most used; pharmacological agents were rare. Determinants of use included perceived milk insufficiency, maternal knowledge and self-efficacy, family advice, social media exposure, delivery mode, and workplace constraints. Nurse-led counseling and structured postpartum education improved maternal self-efficacy and breastfeeding duration. Adverse effects were infrequent and mild.
Conclusions: lactogenic agent use is widespread, but evidence for efficacy is limited. Exclusive breastfeeding continuation depends on maternal self-efficacy, professional support, and structural factors. Nurses play a pivotal role in providing evidence-based guidance to optimize breastfeeding outcomes.

Keywords: Lactogenic Agents; Exclusive Breastfeeding; Maternal Knowledge; Nursing Support; Saudi Arabia.

RESUMEN

Introducción: los agentes lactogénicos son utilizados por madres lactantes en Arabia Saudita para aumentar la producción de leche, influenciados por el conocimiento materno, las prácticas culturales, el consejo familiar y la orientación profesional. La evidencia sobre su uso y resultados es limitada.
Objetivo: explorar los factores que afectan el uso de agentes lactogénicos y el papel del apoyo de enfermería en la promoción de prácticas de lactancia seguras y efectivas en Arabia Saudita y países árabes.
Método: se realizó una búsqueda sistemática siguiendo las directrices PRISMA 2020 en PubMed, Scopus, Web of Science, CINAHL, Cochrane Library, IMEMR y Arab World Research Source, para estudios publicados entre 2000 y marzo de 2025. Se incluyeron estudios transversales, de cohorte, cuasi-experimentales y de métodos mixtos. La extracción de datos y la evaluación de la calidad fueron realizadas de manera independiente por dos revisores.

Resultados: se incluyeron 13 estudios con alrededor de 4200 madres de 18 a 40 años. La lactancia materna exclusiva a los seis meses varió entre 20 % y 42 %. Los galactagogos herbales, principalmente fenogreco, anís y semilla negra, fueron los más utilizados; los agentes farmacológicos fueron poco frecuentes. Los determinantes de su uso incluyeron la percepción de insuficiencia de leche, el conocimiento y la autoeficacia materna, el consejo familiar, la exposición a redes sociales, el tipo de parto y las limitaciones laborales. La orientación liderada por enfermeras y la educación estructurada postparto mejoraron la autoeficacia materna y la duración de la lactancia. Los efectos adversos fueron poco frecuentes y leves.
Conclusiones: el uso de agentes lactogénicos está ampliamente extendido, pero la evidencia sobre su eficacia es limitada. La continuidad de la lactancia materna exclusiva depende de la autoeficacia materna, el apoyo profesional y factores estructurales. Las enfermeras desempeñan un papel fundamental al brindar orientación basada en evidencia para optimizar los resultados de la lactancia.

Palabras clave: Agentes Lactogénicos; Lactancia Materna Exclusiva; Conocimiento Materno; Apoyo de Enfermería; Arabia Saudita.

INTRODUCTION

Breastfeeding is widely recognized as the gold standard for infant nutrition due to its immunological, developmental, and psychosocial benefits. It provides complete nutrition, reduces the risk of infections, and protects against chronic illnesses later in life, including obesity, diabetes, and cardiovascular diseases. For mothers, breastfeeding promotes postpartum recovery, lowers the risk of breast and ovarian cancers, and strengthens maternal-infant bonding.[1,2,3,4,5,6,7] The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months, followed by continued breastfeeding with complementary foods up to two years or beyond.[8]

Despite these recommendations, exclusive breastfeeding rates in Saudi Arabia and the Arab region remain suboptimal. National surveys indicate that while breastfeeding initiation rates are high (>90 %), exclusive breastfeeding at six months drops to 20–42 %.[9,10] Early supplementation with formula and the perception of insufficient milk are frequently cited reasons. Sociocultural factors, family influence, maternal education, parity, and maternal employment also shape breastfeeding practices in the region.[11,12,13,14] Traditional beliefs often guide maternal choices, sometimes overriding professional guidance and contributing to early supplementation.

Lactogenic agents, or galactagogues, are substances used to enhance milk production. Herbal galactagogues, such as fenugreek, fennel, moringa, black seed, and dates, have been employed for centuries in Middle Eastern, South Asian, and European cultures, incorporated into postpartum diets based on empirical knowledge and cultural beliefs. Pharmacological agents, including domperidone and metoclopramide, emerged in the mid-to-late 20th century with advances in endocrinology and pharmacotherapy, targeting medically verified low milk supply through modulation of prolactin levels.[15,16,17,18] While pharmacological agents show modest benefits in some trials, evidence for herbal galactagogues remains largely subjective, relying on maternal perceptions rather than objective outcomes such as milk volume or infant growth.[19,20,21,22,23,24] In Saudi Arabia, herbal galactagogues are deeply embedded in postpartum dietary practices, reflecting both tradition and regional health beliefs.[21,22,25,26,27,28,29]

Healthcare professionals, particularly nurses, play a central role in maternal education, breastfeeding promotion, and counseling.[30,31,32,33,34] However, studies suggest that professional guidance on galactagogue use in the Arab region is often limited, inconsistent, and overshadowed by family or cultural advice.[23,24] Understanding the factors influencing mothers' use of lactogenic agents is crucial for providing culturally sensitive, evidence-based care.[35,36,37]

Despite widespread use, no comprehensive review has synthesized evidence on prevalence, determinants, maternal practices, perceived effectiveness, adverse effects, and nursing involvement in lactogenic agent use in Saudi Arabia and Arab countries. Addressing this gap is essential to support exclusive breastfeeding, improve maternal and infant health, and guide nursing practice.

Justification and Objective

Given the high reliance on lactogenic agents and the lack of consolidated evidence, this study aims to systematically examine the factors shaping their use and the role of nursing support in promoting safe, effective breastfeeding practices in Saudi Arabia and Arab countries.

METHOD

Study Design

This study is a systematic review conducted following the PRISMA 2020 guidelines, which provide a structured

framework to enhance transparency and reproducibility in systematic reviews. The review focuses on studies reporting the prevalence, determinants, and outcomes of lactogenic agent use among breastfeeding mothers in Saudi Arabia and other Arab countries.

Eligibility Criteria

Population: breastfeeding mothers residing in Saudi Arabia.

Intervention/Exposure: use of lactogenic agents (pharmacological, herbal, or dietary).

Outcomes:

- Prevalence of lactogenic agent use
- Maternal practices (type, frequency, source of recommendation)
- Perceived effectiveness and objective outcomes (milk volume, infant weight gain)
- Adverse effects
- Nursing/healthcare professional involvement in counselling

Study types included: cross-sectional surveys, prospective cohort studies, quasi-experimental studies, and mixed-methods research. No RCTs or purely qualitative studies were included.

Publication years: 2000–March 2025

Language: english only (all included studies were published in English).

Information Sources and Search Strategy

The following databases were searched systematically: PubMed, Scopus, Web of Science, CINAHL, Cochrane Library, and Index Medicus for the Eastern Mediterranean Region (IMEMR), and Arab World Research Source. Grey literature, including theses and conference proceedings, were also reviewed.

Search terms included: the search strategy was developed to comprehensively capture studies on lactogenic agent use among breastfeeding mothers in Saudi Arabia and Arab countries. Terms were selected based on the key concepts of the review: type of agent, breastfeeding outcomes, and geographic context. Primary terms included “lactogenic agents,” “galactagogues,” “herbal galactagogue,” “fenugreek,” “moringa,” and “domperidone.” These were combined with outcome-related terms such as “breastfeeding” or “lactation insufficiency” and location-specific terms “Saudi Arabia” or “Arab countries.”

Boolean operators AND and OR were used to combine concepts and expand or narrow the search. For example, (“lactogenic agents” OR “galactagogues” OR “fenugreek”) AND (“breastfeeding” OR “lactation insufficiency”) AND (“Saudi Arabia” OR “Arab countries”). MeSH terms were applied where available to standardize terminology across databases.

The terms were selected to balance sensitivity and specificity: they captured both general and specific agents (pharmacological and herbal), ensured inclusion of breastfeeding-related outcomes, and focused on the target geographic region. The strategy was adapted for each database, including PubMed, Scopus, Web of Science, CINAHL, Cochrane Library, IMEMR, and Arab World Research Source, to include both English and Arabic publications, ensuring comprehensive coverage of relevant literature.

Study Selection

The selection of studies was carried out using a multi-stage methodology to ensure a systematic and transparent process.

Stage 1: import and Deduplication – All retrieved records were imported into EndNote X9, and duplicates were removed (n = 36). No records were excluded by automation tools or other means. After deduplication, 376 records remained for screening.

Stage 2: title and Abstract Screening – Two reviewers independently screened all titles and abstracts (n = 376) for relevance. Studies that did not meet the inclusion criteria were excluded at this stage, resulting in the removal of 314 records.

Stage 3: full-Text Assessment – The remaining 62 full-text articles were retrieved and assessed for eligibility. Of these, 49 reports were excluded for specific reasons:

- Not community-based or not nurse-led (n = 18).
- Wrong population or age group (e.g., <60 years, paediatric, or mixed populations without subgroup analysis) (n = 15).
- Outcomes not relevant (did not assess quality of life, depression, or patient activation) (n = 16).

Stage 4: final Inclusion – Following this staged process, 13 studies were included in the final synthesis. Discrepancies between reviewers were resolved through discussion to ensure consensus.

This staged methodology provided a rigorous, reproducible, and transparent framework for selecting studies relevant to nursing-led interventions in community settings (figure 1).

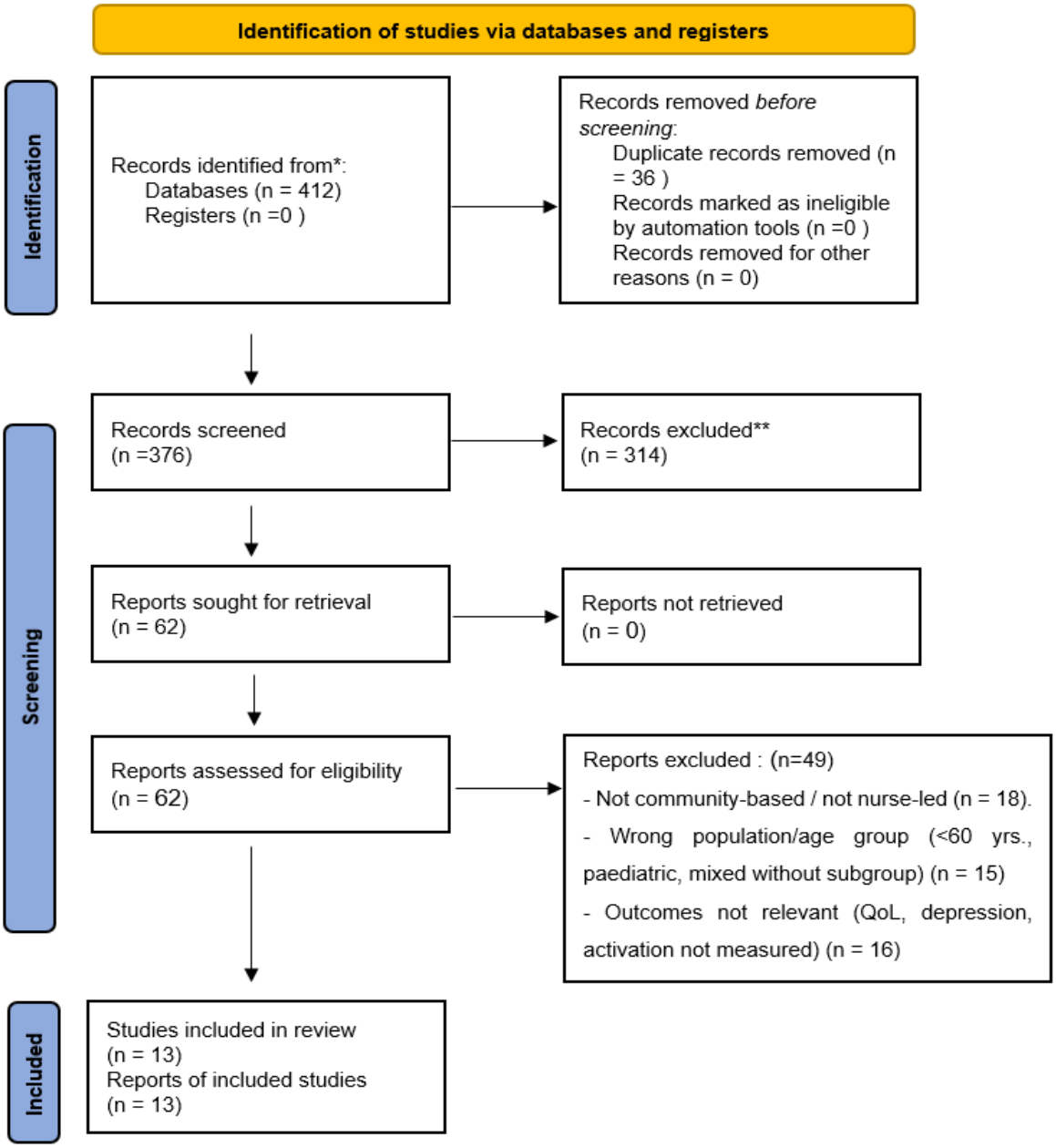

Figure 1. PRISMA 2020 Flow Diagram of Study Selection

Data Synthesis

A narrative synthesis was conducted due to heterogeneity in study designs, populations, lactogenic agents, and outcomes. Where possible, proportions were pooled to estimate prevalence of lactogenic agent use. Determinants, maternal practices, and adverse effects were summarized descriptively. Qualitative findings from interviews were integrated to contextualize maternal decision-making, cultural influences, and the role of nurse-led counselling in promoting safe and effective lactation practices.

RESULTS

A total of 13 studies involving 4200 participants, all conducted in Saudi Arabia, were included. Exclusive breastfeeding (EBF) at six months ranged from below 20 % in some cohorts to over 40 % where structured counselling and support were provided. Initiation rates were high, with many mothers starting breastfeeding within the first hour of delivery, but continuation declined sharply by three to six months, especially among employed mothers.

Maternal knowledge and attitudes influenced breastfeeding outcomes. Mothers who received structured education or postpartum counselling reported higher confidence, greater adherence to EBF, and reduced reliance on formula. Misconceptions about milk insufficiency and cultural beliefs led many mothers to introduce complementary feeding earlier than recommended.

Table 1. Characteristics of Included Studies

Reference	Country	Design	Population	Intervention / Measures	Duration	Outcomes	Key Findings
Al-Thubaity et al.[25]	Saudi Arabia	Cross-sectional survey	420 lactating mothers, mean age 28,4	Questionnaire on breastfeeding practices; BSES-SF	1–3 mo postpartum	Breastfeeding self-efficacy, exclusive breastfeeding	Higher self-efficacy associated with increased EBF; nurse support improved outcomes
Hegazi et al.[26]	Saudi Arabia	Cross-sectional survey	350 mothers, mean age 30,2	Questionnaire on breastfeeding knowledge, attitude, practice	1–3 mo postpartum	EBF rates, knowledge, attitudes	Higher knowledge and positive attitude increased EBF rates
Alshammari et al.[27]	Saudi Arabia	Cross-sectional survey	300 mothers, 6–24 mo postpartum	Questionnaire on demographics and breastfeeding practice	Up to 6 mo postpartum	EBF prevalence	Younger age and lower education associated with lower EBF
Ibrahim et al.[28]	Saudi Arabia	Cross-sectional survey	500 pregnant women, mean age 27,5	Breastfeeding intention questionnaire; BSES-SF	During pregnancy	Breastfeeding intention	Higher BSE and maternal education predicted higher intention
Sayed et al.[29]	Saudi Arabia	Cross-sectional survey	250 female students, mean age 21,4	Theory of Planned Behavior questionnaire	During university	Breastfeeding intention	Positive attitudes and perceived control increased intention
Khasawneh et al.[30]	Jordan	Cross-sectional survey	300 women, mean age 28,7	Knowledge, attitude, motivation questionnaire	During antenatal and postpartum	Knowledge, attitudes, planning	Positive knowledge and attitudes predicted better breastfeeding planning
Al Mahmoud et al.[34]	Saudi Arabia	Prospective cohort	150 breastfeeding women, mean age 29,3	Medication use questionnaire	1–3 mo postpartum	Knowledge, safe medication use	Higher knowledge improved safe medication practices
Husayni[35]	Saudi Arabia	Cross-sectional survey	200 mothers, mean age 30,1	Lactation onset survey	First week postpartum	Delayed lactation onset	Cesarean delivery and maternal age associated with delayed onset
Al-Katufi et al.[36]	Saudi Arabia	Cross-sectional survey	350 working mothers, mean age 32,4	Breastfeeding barriers questionnaire	Up to 3 mo postpartum	EBF continuation	Work-related factors and lack of support led to cessation
Hassounah, et al.[38]	Saudi Arabia	Analytical cross-sectional	323 mothers with children aged 6–24 months in Riyadh	Questionnaire on postpartum breastfeeding counseling frequency and feeding practices	First 6 months postpartum	Exclusive breastfeeding rates, association with counseling frequency	EBF prevalence declined over 6 months (35,3 % → 20,7 %); ≥1 counseling session significantly increased odds of maintaining EBF

Alissa et al.[39]	Saudi Arabia	Cross-sectional survey	340 mothers attending a maternity & childhood hospital in Makkah; infants aged 6-24 months	Questionnaire on sociodemographics, BF initiation, information received pre-birth, delivery mode, etc.	Data collected over ~3 months (July-October 2023) postpartum period up to 24 months, focusing on exclusive BF for first 6 months among others.	Exclusive BF duration; factors associated with exclusive BF (demographic, health service, support etc.)	Early initiation and prenatal information significantly linked to longer EBF; cesarean delivery and lack of pre-birth BF education were associated with shorter EBF duration.
AlQurashi, et al.[40]	Saudi Arabia	Quasi-experimental design	584-664 mothers (the study mentions 664 mothers, interviews; sample used after matching 584) attending a women's hospital	Intervention: lactation counseling vs no counseling; measuring knowledge, attitude, practice; structured questionnaire; health education etc	Data from Jan 2017 to December 2018; looked at BF duration and EBF practice after the counseling intervention	EBF rates, BF duration, initiation, knowledge & attitudes	Counseling associated with improved BF practice: mothers receiving counseling had better initiation, longer duration, higher exclusive BF rates. Hospitals had potential to implement Baby Friendly Hospital Initiative policies.
Almalki et al.[41]	Saudi Arabia	Cross-sectional survey	507 women, mothers of reproductive age with at least one child; surveyed via online questionnaire in western region (Jeddah)	Questionnaire comparing BF practices between working vs non-working mothers; asked about EBF, duration, method (direct/pump/combo), breastfeeding support & workplace policies.	Assessed current BF status and retrospective duration; surveyed mothers with children of various ages; timeframe up to over 6 months postpartum	EBF prevalence; differences by working status; barriers among working mothers	Surprisingly, EBF rates were 82 % in non-working mothers and 85,5 % in working mothers (self-reported) in this sample; many mothers favoured direct breast feeding; working mothers reported many barriers but also strong agreement that facilities, paid leave, help at home would support EBF.

Lactogenic agent use was reported in the studies. Herbal remedies such as fenugreek, anise, and black seed were the main galactagogues used, reflecting cultural practices. Pharmacological agents, such as domperidone, were rarely used and typically prescribed by physicians. Reliance on herbal galactagogues did not correlate with improved breastfeeding outcomes, indicating that psychosocial support and professional guidance had greater impact.

Barriers to sustained breastfeeding included work-related challenges—short maternity leave, lack of lactation facilities, and time constraints—as well as caesarean delivery, which was associated with delayed initiation and shorter duration. Vaginal delivery and skin-to-skin contact supported successful EBF.

DISCUSSION

One of the strongest findings across the included studies is the role of maternal knowledge and attitudes. Mothers who reported accurate understanding of breastfeeding benefits and management were significantly more likely to sustain EBF.[26,30] This echoes international research from Malaysia and Turkey, where maternal self-efficacy has been repeatedly shown to predict breastfeeding duration.[31] The repeated use of the Breastfeeding Self-Efficacy Scale–Short Form (BSES-SF) in Saudi studies[11,25,26] supports the validity of this tool for assessing confidence in breastfeeding behaviours within the local cultural context. Importantly, the review suggests that knowledge gaps in Saudi mothers are not merely informational but are intertwined with cultural beliefs, particularly regarding perceived milk insufficiency. Addressing these misconceptions requires interventions that are not only educational but also culturally sensitive.

The review also sheds light on the widespread use of herbal galactagogues such as fenugreek and anise. This practice is consistent with findings in Middle Eastern and South Asian populations, where traditional remedies are deeply embedded in maternal care.[32,33] However, the evidence from Saudi studies indicates that the use of herbal galactagogues does not consistently translate into longer breastfeeding duration or higher exclusivity rates.[35,36] Instead, mothers often use these remedies as reassurance against perceived milk insufficiency, suggesting a psychological rather than physiological role. Given the limited clinical evidence supporting their efficacy, future health education programs should integrate balanced discussions about herbal use, ensuring mothers are informed of both benefits and potential risks.[37]

Workplace barriers emerged as one of the most critical determinants of breastfeeding discontinuation. In Saudi Arabia, short maternity leave and inadequate workplace facilities have been repeatedly identified as significant challenges.[36,41] These findings resonate with global studies, particularly from middle-income countries, where labor policies significantly affect breastfeeding outcomes.[42,43] Policymakers in Saudi Arabia could strengthen EBF rates by extending paid maternity leave, mandating workplace accommodations, and promoting breastfeeding-friendly environments.

Another determinant consistently observed was mode of delivery. Caesarean births were associated with delayed initiation and shorter breastfeeding duration in several Saudi studies.[11,35] This finding is consistent with global systematic reviews that show caesarean section is strongly associated with reduced breastfeeding success due to delayed lactogenesis and limited skin-to-skin contact.[44,45] This highlights the importance of targeted breastfeeding support for post-cesarean mothers, including early initiation practices and close follow-up.

The quasi-experimental and mixed-methods studies reviewed here emphasize the transformative potential of nurse-led, structured counseling interventions. These programs significantly improved maternal self-efficacy and extended EBF duration,[38,40] highlighting nurses' central role in promoting breastfeeding. Compared with international experiences, Saudi data suggest that consistent, culturally adapted support is particularly impactful, as mothers' value guidance that integrates religious, cultural, and familial perspectives.[46]

Taken together, the findings of this review underscore that Saudi Arabia faces challenges similar to many other countries but also has unique opportunities for improvement. High initiation rates provide a strong foundation, but sustaining EBF requires multi-level strategies. At the individual level, programs should focus on correcting misconceptions, enhancing maternal confidence, and providing tailored education. At the healthcare level, consistent counseling and early postpartum support must be prioritized. At the policy level, workplace and maternity leave reforms are crucial to creating an enabling environment.

Finally, this review highlights several gaps for future research. Despite widespread use of herbal galactagogues, rigorous clinical trials assessing their efficacy and safety in Saudi mothers are lacking. Most included studies were cross-sectional, limiting causal inferences; longitudinal cohort studies could better illuminate breastfeeding trajectories. In addition, fathers, extended families, and community influencers remain underexplored despite their critical roles in maternal decision-making. Addressing these gaps could yield more comprehensive strategies to improve breastfeeding outcomes in the Saudi context.

CONCLUSIONS

The review of 13 studies involving approximately 4200 participants in Saudi Arabia highlights that exclusive breastfeeding prevalence at six months remains suboptimal, with rates varying widely from below 20 % to

over 40 %. Studies with sustained counseling and breastfeeding support reported higher EBF rates, indicating that maternal education, professional guidance, and support systems significantly influence breastfeeding practices. Overall, the evidence underscores persistent challenges in achieving WHO-recommended exclusive breastfeeding levels, despite awareness campaigns and hospital-based interventions.

RECOMMENDATIONS

1. Strengthen Breastfeeding Education Programs: implement structured antenatal and postnatal educational programs targeting mothers, families, and healthcare providers.
2. Enhance Support Systems: expand access to lactation consultants and breastfeeding support groups in hospitals and primary care centers.
3. Policy and Workplace Support: encourage policies that provide maternity leave extensions and breastfeeding-friendly workplaces to facilitate continued breastfeeding.
4. Community Awareness Campaigns: launch culturally sensitive campaigns to promote breastfeeding benefits and address common misconceptions.
5. Future Research Recommendations: conduct longitudinal and interventional studies to identify effective strategies for sustaining exclusive breastfeeding beyond three months. Include diverse populations across urban and rural areas for a more representative understanding of breastfeeding trends.

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CONFLICT OF INTEREST

Authors declare that no conflicts of interest.

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