

Effectiveness of Breastfeeding Support Packages in Low- And Middle-Income Countries for Infants Under Six Months: A Systematic Review

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DOI: <https://doi.org/10.51584/IJRIAS.2026.11090023>

Received: 12 September 2026; Accepted: 17 September 2026; Published: 03 October 2026

ABSTRACT

Introduction: Breastfeeding is crucial for improving infant health and survival, particularly in low- and middle-income countries (LMICs) 22 LMICs represented where malnutrition and infectious diseases are prevalent. The World Health Organization (WHO) recommends exclusive breastfeeding throughout the first six months of a baby's life, but many mothers in low- and middle-income countries (LMICs) faced challenges. This systematic analysis aimed to evaluate the effectiveness of breastfeeding assistance programs in low- and middle-income countries (LMICs) in promoting exclusive breastfeeding of infants younger than six months.

Method: In compliance with the PRISMA (preferred reporting items for systematic review and meta-analysis protocols) statement, we created and adhered to a standard systematic review protocol (PROSPERO 2018, CRD42018102795).

Result-Prisma Flow Diagram: The search results and the selection process were shown. The search turned up 15,256 records. After duplicates were removed and titles and abstracts were reviewed, 16 of the 155 entries that were available in "abstract only" form could be read in full. Out of the 139 remaining records, 98 did not meet the inclusion criteria. The last 41 studies were included in the primary analysis. (Iwasaki and others, 2018)

Conclusion: Future feeding decisions for young, nutritionally vulnerable infants under six months are not well-informed. Nonetheless, a lot of the knowledge gained from treatments that target a broader spectrum of newborns and infants under six meters can be applied. It has been demonstrated that the breastfeeding counseling, education, training, promotion, and peer support packages improve breastfeeding outcomes.

All infants under six months old can use the packages in our review as "primary prevention" therapy. It is possible that the same packets, with only minor modifications, can also sustain small/at-risk infants under 6 m, albeit formal research is needed to validate their effectiveness for this demographic. Future research of this kind ought to concentrate on results that have clinical significance. (Spiga and others, 2018)

Key Words: Breastfeeding, Breastfeeding exclusively, baby health, peer support, peer support, training health workers, and systematic review.

INTRODUCTION

A major public health concern that requires immediate worldwide attention is newborn and child malnutrition in low- and middle-income countries (LMICs). Target 2.2 of the Sustainable Development Goals states, "By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under-five years of age."

Recent estimates suggest that wasting alone might put the lives of 50.5 million (7.5%) of the world's children under five at risk. These youngsters are 2.3 times more likely to die than children without

anthropometric disabilities. In recent years, the treatment of older children with acute malnutrition in LMICs has been revolutionized by Community-based Management of Acute Malnutrition (CMAM), a public health-focused approach to care. It's the most recent. In 2018, Morgan et al. The WHO/United Nations Children's Fund (UNICEF) worldwide plan for infant and young child feeding (IYCF) recommends exclusive breastfeeding (EBF) for the first six months of life and early start of nursing (EIBF) within an hour of delivery. Although breastfeeding prevalence varies by infant age and can occasionally vary dramatically within and across countries, only approximately 37% of newborns under the age of six months in low- and middle-income countries (LMICs) obtain exclusive breastfeeding. (Sanni and others, 2018) There have been reviews of nursing support therapies in the past, but most of them focus on general IYCF (less than two years) procedures for young children. The goal of this study is to fill in the knowledge gap about the best strategies for promoting breastfeeding in nutritionally vulnerable infants (those younger than six months).(Tesfaye and others, 2028)

METHODOLOGY

In compliance with the PRISMA (preferred reporting items for systematic review and meta-analysis protocols) declaration, we created and adhered to a standard systematic review protocol (PROSPERO 2018, CRD42018102795).

Design

Randomized control trials (RCTs), quasi-experimental, cohort, cross-sectional, and other comparative observational studies were among the studies we chose. Context: Since LMICs have the highest rate of newborn malnutrition worldwide, we considered research that concentrated on these settings.

Population

We looked at research with infants younger than six months. Intervention: Research that used breastfeeding support packages as the intervention of interest was eligible. Support packages were described as any type of breastfeeding instruction, training, counseling, and assistance given to caregivers and/or healthcare personnel with the goal of enhancing breastfeeding practices and/or knowledge, skills, and practices.

Eligibility Criteria

To guarantee that only pertinent and excellent research were included, the eligibility requirements for the systematic review were set prior to the literature search. The Population, Intervention, Comparison, Outcomes, and Study Design (PICOS) paradigm served as the foundation for the criteria.

Inclusion Criteria

- The study focused on nursing assistance packages provided to mothers of infants less than six months of age. These packages comprised teaching, peer support, and counseling.
- Studies conducted in low- and middle-income countries (as defined by the World Bank).
- Cohort, case-control, and randomized controlled trials are examples of primary research studies that evaluate the effectiveness of interventions.
- Studies that offer data on exclusive breastfeeding rates, newborn health (morbidity, death), maternal satisfaction, and cost-effectiveness.
- Articles published in English (or other relevant languages if acceptable and translatable).

Exclusion Criteria

- Research conducted in wealthy countries.
- studies that do not focus on infants less than six months.

- Interventions that have nothing to do with promoting breastfeeding, including general maternal health programs.
- Editorials, opinion pieces, and commentary (unless they contain primary data or a systematic evaluation).
- Research published before a pre-established deadline (for instance, research published before 2000 may be ignored depending on the analysis's parameters).

Sample Size Estimation

Because the study was a systematic review of published literature rather than a primary investigation with human participants, it did not utilize a statistical method to assess sample size. Rather, a thorough search of electronic databases yielded all eligible studies that were included in the sample. The review searched five databases (PubMed, CINAHL, EMBASE, Cochrane Library, and Global Health) from database creation to July 18, 2018, in accordance with PRISMA criteria. Consequently, the search yielded the following results for the modified review: This guaranties that freshly published research between the first search and September 2026 are found and prevents the update from being arbitrarily started at 2018. Database creation date: September 21, 2026 Database inception. The updated strategy used four major concepts as compared to the previous, infants, child under six months, newborn and neonate.

Sampling Methodology

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria were followed in the study's systematic review approach. The review protocol (CRD42018102795) was prospectively registered in PROSPERO. Five electronic databases were thoroughly searched, spanning all papers from the database's creation to July 18, 2018: PubMed, CINAHL, Cochrane Library, EMBASE, and Global Health.

Study Variable

- Exposure/Intervention is an independent variable.
- The breastfeeding assistance package used to enhance nursing habits among moms of infants younger than six months was the independent variable. Among the interventions were:
 - Education about breastfeeding
 - Counseling for individual breastfeeding
 - Counseling in groups
 - Programs for peer assistance
 - Promoting breastfeeding in the community
 - Community health workers visiting homes
 - Training for healthcare professionals regarding breastfeeding support
 - The Baby-Friendly Hospital Initiative (BFHI)
 - Combined breastfeeding support interventions (multi-component packages)

Dependent Variables (Outcomes)

Studies reporting son at least one of the following outcomes breastfeeding practices, knowledge/skills/practices of healthcare workers and/or caregivers. The dependent variables were the breastfeeding-related outcomes used to evaluate the effectiveness of the interventions. Among them were:

- Rates of exclusive breastfeeding (EBF)
- Early initiation of breastfeeding (within one hour of birth)
- The length of time spent exclusively breastfeeding
- Maintaining breastfeeding
- Any prevalence of breastfeeding

- Knowledge of breastfeeding mothers
- Maternal breastfeeding attitudes and practices
- Maternal breastfeeding self-efficacy or confidence
- Knowledge and abilities of healthcare professionals about breastfeeding support

Data Collection

Instead of conducting participant interviews or observations for the systematic review "Effectiveness of Breastfeeding Support Packages in Low- and Middle-Income Countries for Infants Under Six Months: A Systematic Review," information was gathered using a methodical search and extraction procedure.

Data Collection Procedure

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria were adhered to the data collection. Five electronic databases were searched thoroughly for relevant literature:

- PubMed
- CINAHL
- EMBASE
- Cochrane Library
- Global Health

Predefined search phrases pertaining to breastfeeding, breastfeeding support interventions, infants under six months, and low- and middle-income countries were used to search the databases from the time of their creation until July 18, 2018. The reference lists of qualifying publications were manually screened to find more pertinent studies.

Data Analysis

We decided to do a narrative synthesis using the Synthesis Without Meta-analysis (SWiM) reporting guideline because meta-analyses were considered inappropriate due to the review's wide range of interventions and outcomes. Counseling, education, training, promotion, peer support, and other intervention categories were used to categorize the studies. Breastfeeding practices, caregivers' knowledge, skills, and practices, healthcare staff knowledge, skills, and practices, morbidity, and anthropometry were the five categories into which the results were divided.

The effect measures were inconsistent because many of the studies reported multiple measures of the same outcome and/or examined outcomes at different time points. As reported by the different studies, the results were first summarized per outcome in tables that included differences (mean/median/prevalence) and/or ratios (prevalence/risk/hazard) between the intervention (IG) and control group (CG).

After that, we converted difference/ratio measures to standardized metric-direction of effect (positive/negative/mixed/no effect) in order to summarize the results. Finally, the data was compiled in tabular form using vote counting depending on the direction of effects in order to determine "is there any evidence of an effect" of five intervention categories on each outcome. If there were three or more comparisons available for each outcome and intervention category, we computed the proportion of effects.

Ethics

We sent the review procedure to the London School of Hygiene and Tropical Medicine's Research Ethics Committee (LSHTM MSc Ethics ref: 15968). The review was evaluated and determined not to require ethical approval because it was a systematic evaluation of publically accessible material.

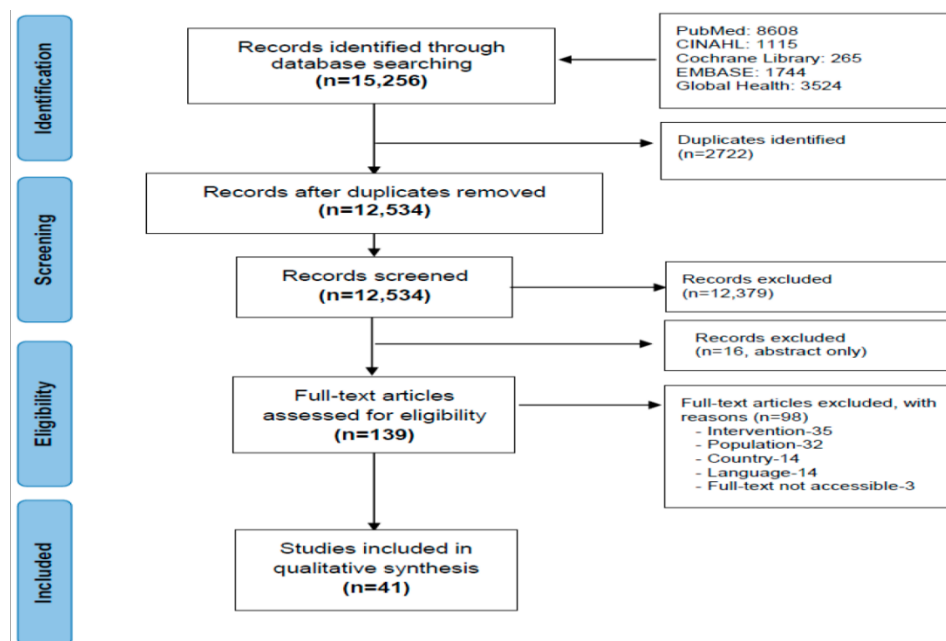
RESULT

Result – Prisma Flow Diagram

For this topic, "Effectiveness of Breastfeeding Support Packages in Low- and Middle-Income Countries for Infants under Six Months," the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Flow Diagram creation procedure usually consists of the following four stages:

- Identification
- Screening
- Eligibility
- Included and Excluded Data.

Prisma Flow Diagram



RESULTS- BACKGROUND

There were many similarities and overlaps between the interventions, even though they were categorized into the following areas (as indicated by the authors): education, training, counseling, promotion, and peer support. Peer assistance for breastfeeding promotion (promotion–peer support), staff-led educational sessions (education–training), training programs for counselors (training counseling), and father education as a support system (education peer support) are a few instances of these treatments. Because of this, it was essential to look into the details of each intervention. To make the differences between them clear, future definitions may also need to be standardized. Think about the words "education" and "training." Even if anyone can enroll in a training session, the word "education" might imply that participants have fulfilled strict prerequisites for knowledge and abilities. Interventions (1) that was well-organized (2) short educational videos, and (3) utilizing community health workers (CHWs) who are currently employed. (Razon et al., 2018), (4) Peer support assistance.

Most studies showed improvements in nursing outcomes, which are frequently measured by EBF prevalence. However, these results were self-reported rather than scientifically measured. Breastfeeding practice reporting may be influenced by a variety of circumstances, such as social desirability bias, which could lead to an over reporting of positive practices. Future studies should consider objective measurements, including assessing milk production using the isotope dilution technique.

The target population that spurred this evaluation presented a unique difficulty because there were very few studies ($n = 3$) that particularly addressed or reported separate data for newborns under 6 m who were already petite, malnourished, or had demonstrated growth failure. We added a bigger cohort in the hopes of identifying general population lessons that may be applied indirectly. (Nwachan et al., 2018)

Results-Narrative

Of the 37 studies reporting breastfeeding practices, three sets of studies reported similar data and nine studies reported more than one comparison, making up a total of 42 comparisons for synthesis. Of these 42 effects, 12 assessed counseling, 10 educations, nine training, five promotions, two peer supports, and four comparisons assessed other type of interventions.

Counseling: Treatments are favored by seven of the twelve category effects ($p = 0.77$, 95% CI 31% to 80%). Hospital-based counseling was included in 12% of the trials. Three compared standard medical care with counseling. One study, which included premature children, demonstrated a positive increase in EBF from birth to four months, but two other studies, which included normal newborns, showed no effect on EBF at 4/6 months. (Isanovic et al., 2024) An alternative

Education: Of the 10 impacts in the education category, 8 of them (80%, 95% CI 49% to 94%, $p = 0.10$) support interventions. The influence of hospital-based education was assessed in 15% of the studies. In three trials, educational interventions were compared to standard care. Two of them showed a positive improvement on EBF at four months, whereas one research found no effect at six months. The effect of father education was assessed in three further trials (IG1: mother and father, IG2: moms only). A Brazilian study revealed that the mother and father group had a positive impact on EBF at six months, while the group that only got schooling had no effect. (Agedew et al., 2017) This was in contrast to the group that received no intervention. Two more trials demonstrated a positive effect on EBF at six months when compared to mothers.

Five benefits of training are among the nine effects on the training category. Peer support: Intervention benefits from only one of the two effects of peer support. Four research (eight percent) assessed how peer support affected the community. Three studies by a similar research group that reported similar data looked at the impact of teaching dads without any training versus fathers; the authors found that the intervention group's EBF at six months had improved. Another study assessed the effects of a mother-to-mother support program. Conflicting findings regarding nursing behaviors were found in this study. (Spiga et al., 2018)

Interventions are supported by all five of the promotion category effects (100%, 95% CI 56% to 100%, $p = 0.06$). Three studies (7%) assessed the effect of hospital-based promotion. One study, which was based on the idea of planned behavior, evaluated

Direct and Indirect Evidences

The evidence should be clearly separated into direct and indirect evidence for this systematic review. This is especially crucial because just three of the 41 studies in the initial evaluation specifically addressed or independently reported undersized, malnourished, or growth-faltering infants younger than six months. The majority of the remaining data were from general mother-infant populations or larger populations of infants younger than six months.

Direct evidence: infants specifically under six months

Studies where the study population was particularly made up of infants younger than six months and the breastfeeding results were examined within this age range should be considered direct evidence.

The direct-evidence category was separated into two categories for this review:

Direct evidence in all infants under six months

Regardless of nutritional condition, these studies specifically assessed breastfeeding support for infants aged 0–<6 months.

Eligible interventions included

support given to mothers, fathers, caregivers, or medical professionals; breastfeeding education; breastfeeding training; peer support; breastfeeding promotion; facility-based breastfeeding support; community-based breastfeeding support.

The main results consisted of

exclusive breastfeeding; ongoing breastfeeding; early breastfeeding initiation; frequency and duration of breastfeeding; prelacteal feeding; suitable breastfeeding techniques; and caregiver breastfeeding expertise 41 research, spanning 22 LMICs, were found to meet the original review's eligibility requirements. There were twenty hospital-based studies, twenty community-based studies, and one study that contrasted hospital and community methods. The results of breastfeeding practices were reported in 37 studies.

Particularly in small, undernourished, or nutritionally vulnerable infants less than six months. Since this segment most closely resembles the population of most clinical concern, it was regarded as the highest-priority direct evidence subgroup.

Only three studies that specifically addressed or individually reported data for infants under six months who were tiny, malnourished, or had documented growth failure were found in the review. Because their dietary and clinical characteristics may alter the efficacy of breastfeeding support, these research was presented separately from the general under-six-month group.

Indirect evidence: broader infant populations

In the primary analysis, indirect evidence should not be mixed with direct evidence. Studies where the intervention was pertinent to breastfeeding but the population was larger than the target group of infants under six months are referred to as indirect evidence.

Examples consist of

infants between the ages of 0 and 12 months; infants between the ages of 0 and 24 months; children under the age of two years; mother-infant populations in which the infant's age was not limited to less than six months; studies reporting general feeding outcomes for infants and young children; and studies in which the results for infants younger than six months could not be distinguished from those for older infants.

Caregivers' Knowledge/Skills/Practices

Ten comparisons were left to help with the synthesis because three of the twelve studies that reported on the skills, knowledge, and behaviors of caregivers provided comparable data. Of these ten outcomes, four assessed counseling, four assessed education, and four assessed promotion.

Counseling: An analysis of the effects of hospital-based counseling was conducted using the BASNEF (Beliefs, Attitudes, Subjective Norms, and Enabling Factors) model. The scientists found that both the mean structural scores and the mean lactation performance ratings in the BASNEF model demonstrated positive impacts. (Tesfaye et al., 2017)

Education: Interventions are preferred by three out of the four impacts in the education category (75%, 95% CI 30% to 95%, $p = 0.62$). Three studies (7%) focused on hospital-based educational initiatives. One study

compared the effects of education for mothers and fathers on nursing to that of education for mothers only. This study found positive results in both mean breastfeeding.

Healthcare Staff Knowledge/Skills/Practices

One of the two studies that looked at the skills, knowledge, and behaviors of healthcare workers offered a lot of comparisons—up to three in total—which aided in the synthesis. All three assessed the training techniques. Intervention is preferred over the other two training categories by one effect (33%, 95% CI 6% to 79%, $p = 1.00$). A study evaluated the effectiveness of hospital-provided breastfeeding DVD teaching. The authors discovered that the mean knowledge and confidence scores of healthcare personnel had improved in comparison to the control group. The effect of community-based special training on TBAs/CVs was evaluated in another study. Training enhanced TBAs/CVs' comprehension of EIBF, but it had no effect on other knowledge items, the authors found. (Mihretie Adugna et al., 2018)

Morbidity

A total of nine studies—nine comparisons for synthesis—of which one reported multiple comparisons of the nine studies showing morbidity and two reported comparable findings. Two of these nine effects assessed training, three assessed education, three assessed counseling, and one comparison assessed a different type of intervention.

Counseling: Of the three category impacts of counseling, two effects favor treatments (66%, 95% CI 20% to 93%, $p = 1.00$). Counseling in the community accounted for 7% of the research. Two trials with similar data found no benefit of counseling on diarrheal morbidity in South Africa, Uganda, or Burkina Faso. Another study conducted in Mexico that assessed the effects of six (IG1) and three (IG2) in-home peer counseling visits found that they had a positive influence on diarrhea in children less than three months. (Mattes et al., 2018)

Anthropometry

Out of the eleven studies that used anthropometry, ten comparisons were left for synthesis; two of the studies yielded comparable results. Of these ten outcomes, three assessed education, four assessed training, one assessed promotion, and three assessed counseling. (Santoso et al., 2017)

Counseling

Only one effect (33 percent, 95% CI 6% to 79 percent, $p = 1.00$) of the three category impacts of counseling favors intervention. Two studies (5%) examined the effects of hospital counseling. In one study, the mean infant weight from birth to four months was positively impacted by counseling based on the BASNEF model. There was no correlation between counseling and mean weight in the other research. Two studies (5%), each with similar data, assessed the effects of community-based counseling in Burkina Faso, Uganda, and South Africa. Overall, the weight-for-length z (WLZ) and length-for-age z scores did not differ, according to the authors. (Goudet et al., 2017)

IMPLICATIONS OF THE FINDINGS

This analysis identified a large number of breastfeeding support packages for infants under 6 months in LMICs. Details of these support packages are given in Table S1. These programs can serve as "primary prevention" interventions for all newborns in LMICs under six months of age (IYCF). But for babies who are already little and vulnerable, breastfeeding support packages need to be specially created and thoroughly tested. These operations may thereafter be utilized as "secondary/tertiary" therapy for infants at risk for growth failure. It should be mentioned that only nursing infants can use these models. For people who are not currently nursing for a number of reasons, other therapies such wet nursing, establishing/re-establishing

breastfeeding, extra suckling, breastmilk substitutes, etc., should be looked into. These activities will make an even greater contribution. (ul Haq et al., 2018)

Which factors, in infants under 6 months old who are exclusively breastfed, are linked to development failure and morbidity (diarrhea, respiratory disease, and hospitalization)?

Which breastfeeding therapies, when applied to babies who are more at-risk (premature babies, preterm, LWB, twin babies, or babies with anthropometric deficits/growth failure), are successful in improving breastfeeding behaviors and the accompanying morbidity/mortality outcomes? (Razon et al., 2018)

Which breastfeeding education programs work best for enhancing the knowledge, abilities, and practices of medical staff members, and what key components make those programs effective?

Which breastfeeding support packages are most appreciated by moms and caregivers, and why (for example, moms' views of value may also center on the amount of time required to attend; the confidence that is built during participation; or the impression that a specific intervention is providing them with adequate support). (Diddana, 2017)

CONCLUSION

There isn't much data to directly inform future feeding choices for young, nutritionally fragile infants younger than six months. However, many of the lessons learned from therapies that target a wider range of neonates and infants under 6 months can be usefully used. The packages on breastfeeding counseling, education, training, promotion, and peer support were proven to have a positive effect on breastfeeding outcomes. The packages in our review can be utilized as "primary prevention" therapies for all infants younger than six months. Although formal research is required to confirm their efficacy for this demographic, it is feasible that the identical packets, with only minimal alterations, can also sustain small/at-risk infants under 6 m. Future studies of this type should focus on outcomes that are clinically meaningful. (Spiga et al., 2018).

RECOMMENDATION

The following key findings came from the systematic review of "Effectiveness of Breastfeeding Support Packages in Low- and Middle-Income Countries for Infants under Six Months": Enhance Access to Breastfeeding Support, Provide Culturally Specific Interventions, Increased Community Health Worker Training Programs, Strengthened Advocacy and Policy Initiatives, Created Sturdy Monitoring and Evaluation Systems, Promoted Community and Family Involvement, etc. These recommendations typically aimed to improve breastfeeding behaviors in low- and middle-income countries (LMICs), improved neonatal health outcomes, and reduced infant mortality rates by encouraging the use and efficacy of breastfeeding support packages.

Promoted Multi-Sector Collaboration: Encourage collaboration between governments, non-governmental organizations (NGOs), health systems, and international organizations to ensure that breastfeeding support programs are adequately funded, integrated, and long-lasting in LMICs. Bhutta & Berkley (2017)

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