

A Scoping Review of Interventions and Outcomes for Postpartum Mothers

Abstract

Background: The recommendation to breastfeed is based on its numerous benefits. Challenges in breastfeeding success involve both the mother and baby. Immediate skin-to-skin contact after birth helps the baby learn to suckle naturally. This review aims to explore breastfeeding interventions and outcomes throughout the breastfeeding journey. **Materials and Methods:** The research employed a scoping review methodology to assess breastfeeding interventions and outcomes in postpartum mothers. The scoping review followed Arksey and O'Mallee's (2005) methodological framework, and the literature search was conducted using databases such as PubMed, Scopus, Cochrane Library, and Web of Science. Duplicate articles were removed, and the remaining articles published between 2000 and 2023 were reviewed by multiple authors to ensure alignment with the established criteria. **Results:** Twenty-four articles of the review regarding breastfeeding interventions encompass nutritional support for mothers, maternal massage, education, and relaxation techniques. As for the outcomes associated with breastfeeding, the review examined factors such as milk production, postpartum comfort, breastfeeding support, self-efficacy in breastfeeding, breastfeeding knowledge, duration of breastfeeding, breastfeeding success, and maternal stress levels. **Conclusions:** This scoping review highlights the potential benefits of maternal massage and educational interventions for improving breastfeeding outcomes in postpartum mothers. Practical applications could include offering maternal massage services or training, comprehensive breastfeeding education programs focused on skills, knowledge, and self-efficacy, and tailored support for mothers facing low milk supply or breastfeeding challenges. Future research should optimize such interventions' timing, delivery methods, and cultural adaptations across diverse breastfeeding populations.

Keywords: Breastfeeding, massage, postpartum period

Introduction

Breastfeeding is a vital and beneficial practice for mothers and newborns, providing optimal nutrition and promoting overall health. Central health authorities widely recommend it as the ideal strategy for newborn nutrition.^[1] The 20th century saw significant declines in breastfeeding rates, particularly in high-income countries, due to social changes. Concerns about this decline led to extensive research on the benefits of breastfeeding and its protective effects for mothers and children. Pro-breastfeeding initiatives, including the World Health Organization (WHO) International Code of Marketing of Breast Milk Substitutes in 1981 and the Innocenti Declaration on Breastfeeding in 1990, were crucial in addressing the issue.^[2]

The well-established advantages of exclusive breastfeeding for children span short- and long-term outcomes,

encompassing healthier dietary habits, shorter hospital stays, favorable weight gain, lower body mass index, reduced adiposity, enhanced cognitive and behavioral development, and metabolic stability in children with metabolic disorders.^[3] Despite the acknowledged importance of breastfeeding, postpartum mothers face diverse challenges on their breastfeeding journey. These challenges may arise from internal factors like stress, motivation, and perception, and external factors such as social support, hospital practices, and resource accessibility. Thus, the success of breastfeeding is influenced by a complex interplay of individual, societal, and healthcare system factors.

Through a comprehensive review of the literature, it is evident that the pivotal window for impactful breastfeeding interventions is within the initial month following childbirth, as new mothers naturally

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prioritize breastfeeding during the early postpartum phase. Commencing breastfeeding interventions within the first week after delivery emerges as a critical catalyst for fostering smoother maternal adjustment during this period. Delaying these interventions may impede the adjustment process, prolonging challenges for mothers.^[4] Various breastfeeding interventions have emerged and been implemented to optimize postpartum mothers' breastfeeding outcomes. While previous reviews have examined breastfeeding interventions, there is a lack of synthesis on the specific outcomes and effectiveness of these interventions across the whole breastfeeding journey for postpartum mothers.^[5-7] This scoping review aims to fill this gap by comprehensively evaluating the range of interventions and their impacts on key breastfeeding outcomes from initiation through duration and cessation. This review can inform healthcare practices and policies to better support postpartum mothers by identifying effective breastfeeding interventions and associated outcomes. The findings can guide the development and implementation of evidence-based strategies tailored to address breastfeeding mothers' specific challenges, ultimately improving maternal and infant health outcomes. This review aims to explore breastfeeding interventions and outcomes throughout the breastfeeding journey.

Materials and Methods

The research employed a scoping review methodology to assess breastfeeding interventions and outcomes in postpartum mothers. In this study, conducted in May 2023, the authors evaluated the research on breastfeeding interventions and results using a scoping review methodology. The review's objectives were to explore breastfeeding interventions and outcomes throughout the breastfeeding journey. Up to 25 papers that met the research's inclusion and exclusion criteria were found. Inclusion requirements for this study are 1) articles on breastfeeding interventions in postpartum mothers, 2) articles published until 2000 to May 20, 2023, 3) articles in English, 4) articles with randomized controlled trials, true experimental and quasi-experimental research designs. The exclusion criteria in this study are articles from theses, books, reviews, seminar papers, public policies, guidelines, and data reports.

Using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Quasi-Experimental Studies, the reviewed publications (Non-Randomized Experimental Studies) were assessed. The research findings showed that the 25 articles were of significant worth. The scoping review followed Arksey and O'Malley's (2005) methodological framework, which includes: (1) identifying the research question, (2) identifying relevant studies, (3) study selection, (4) charting the data, and (5) collating, summarizing, and reporting the results. One of the authors searched the literature using the following databases: PubMed, Scopus, Cochrane Library, and Web of Science. We employed the

Boolean technique of "AND" and "OR" with the terms described in Table 1 to conduct a comprehensive search across multiple databases. Upon completion of the initial search, duplicate articles were identified and removed by the second author. Subsequently, the titles and abstracts of the remaining articles were screened independently by the first and third authors to ensure mutual correction. Articles meeting the inclusion criteria were then subjected to a full-text review by the first, third, and fifth authors [Figure 1]. Discussions and consensus among the authors resolved any disagreements regarding study eligibility. The following search terms were used in the scoping review: "breastfeeding interventions," "postpartum mothers," "breastfeeding outcomes," "maternal massage," "breastfeeding education," "nutrition support for breastfeeding," and "breastfeeding relaxation techniques."

Ethical considerations

As this study is a scoping review that involves the collection, analysis, and synthesis of data from previously published literature, it does not involve any direct contact with human participants or the collection of primary data. Therefore, formal ethical approval was not required. However, ethical standards were maintained throughout the review process by ensuring that all included studies were properly cited and that intellectual property rights were respected. Only publicly available data from peer-reviewed articles and reputable sources were used. The review was conducted following rigorous methodological guidelines to ensure transparency, accuracy, and integrity of the findings.

Results

Articles were reviewed from various countries and were published between 2000 and 2022. The number of respondents in this article also meets the minimum limit of respondents, which is 28 respondents, but the average number of respondents is 60 people. Most articles used a randomized control/clinical trial and quasi-experimental design [Table 1].

The review categorizes breastfeeding interventions into four main categories: nutrition provided to mothers, massage given to mothers, educational interventions, and relaxation techniques. These interventions were evaluated for their effects on a range of breastfeeding outcomes, encompassing milk production, postpartum comfort, breastfeeding support, maternal self-efficacy in breastfeeding, breastfeeding knowledge, duration of breastfeeding, breastfeeding success, and maternal stress levels.

Discussion

The overarching aim of this review is to delve into the realm of breastfeeding interventions and their corresponding outcomes across the entirety of the breastfeeding journey. The discussion of the review results categorizes breastfeeding interventions into four

Table 1: Characteristics of the Respondents, Outcomes, and Results of Reviewed Studies

(First Author, Study design Year)	Study design	Location	Participants	Intervention(s)	Outcome	Measurement tools
Dotd <i>et al.</i> (2015) ^[17]	A Quasi-Experimental Design with a pretest, intervention, and post-test phases, along with a control group	Brazil	201	Intervention Group: Intervention using the flip chart titled “I Can Breastfeed My Child.”	The intervention group demonstrated higher self-efficacy scores, increased breastfeeding continuation, and longer exclusive breastfeeding duration.	BSES-SF scale (Technique and Intrapersonal Thoughts)
Dodou <i>et al.</i> (2021) ^[18]	Randomized Clinical Trial (RCT) based on CONSORT	Brazil	120	An educational intervention delivered via telephone to promote maternal breastfeeding self-efficacy.	Effectively promoted maternal confidence in breastfeeding.	BSES-SF scale (Technique and Intrapersonal Thoughts)
Cavalcanti <i>et al.</i> (2019) ^[19]	Randomized clinical trial	Brazil	251	Intervention Group: Pairs of mothers and children in the IG and the Control Group (CG).	Duration and frequency of exclusive breastfeeding.	A booklet containing breastfeeding information, which was based on the official guidelines provided by the Brazilian Ministry of Health and the World Health Organization
Héon <i>et al.</i> (2016) ^[20]	A pragmatic pilot Randomized Controlled Trial (RCT)	Canada	N/A	Intervention Group: extremely preterm infants.	Breast milk production.	Lipid Concentration Analysis: Breast milk samples were collected three times during the study and analyzed for their lipid concentration.
Porteous <i>et al.</i> (2000) ^[21]	A Randomized Controlled Trial	Canada	52	Participants who provided their consent were randomly allocated to either the control or intervention groups.	Effect on the duration of breastfeeding.	Fisher’s Exact Test
McKeever <i>et al.</i> (2002) ^[22]	A Randomized Controlled Trial	Canada	101	In-home lactation support was provided by nurses who were certified lactation consultants.	Breastfeeding rates and maternal satisfaction.	Data collection forms that assessed breastfeeding rates and maternal satisfaction.
Lu <i>et al.</i> (2019) ^[23]	A quasi-experimental design with a non-equivalent control group and repeated measures	China	80	The intervention group, the Tuina group, received daily peri-mammary injections, while the control group received routine medical treatment.	Comparison between formula feeding and breastfeeding, considering both nutritional and non-nutritional aspects.	Therma CAMTMP30 (FLIR systems, Sweden), Special measuring caliper designed for breast volume measurement (Chinese pattern: ZL2012 20123439. X), Enzyme-linked immunosorbent assay (ELISA)
Liu <i>et al.</i> (2018) ^[24]	A randomized interventional	China	60	Mothers who were separated from their babies received education from investigators using the health belief model, while the control group received routine education from obstetric nurses.	Intervention based on the health belief model significantly stimulated milk secretion in mothers who were separated from their babies.	State-Trait Anxiety Inventory (STAI), State-Trait Anxiety Questionnaire
Handayani <i>et al.</i> (2020) ^[25]	A double-blind post-test only control RCT study	Indonesia	50	Participants were assigned to two treatment groups: one received katuk leaf biscuits, while the other did not.	Breastmilk volume.	Body Mass Index (BMI), Perceived Stress Scale (PSS-10) questionnaire, Mann-Whitney test

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Table 1: Contd...

(First Author, Year)	Study design	Location	Participants	Intervention(s)	Outcome	Measurement tools
Triansyah <i>et al.</i> (2021) ^[26]	Pre-experimental, one group pretest and post-test	Indonesia	30	Breast care and oxytocin massage pre- and post-interventions.	Breastmilk production.	Mc Nemar test
Aghdas <i>et al.</i> (2014) ^[27]	A randomized control trial	Iran	114	Intervention Group: regular care group and skin-to-skin contact SSC Group.	Maternal breastfeeding self-efficacy at 28 days after delivery was the main result.	Infant Breastfeeding Assessment tool (IBFAT), breastfeeding self-efficacy scale (BSES)
Shiraishi <i>et al.</i> (2021) ^[28]	A randomized control trial	Japan	100	One month after childbirth, a group of healthy women was randomly divided into an intervention group (100 participants) and a control group (94 participants).	Dietary intake of nutrients and food group consumption.	Brief-type self-administered diet history questionnaire (BDHQ)
Kang <i>et al.</i> (2008) ^[29]	A quasi-experimental design with a non-equivalent control group and repeated measures	South Korea	68	A new breastfeeding empowerment program was provided to postpartum mothers within 3 days of entering postpartum care centers.	Positive effects on their breastfeeding empowerment, problem-solving abilities, and breastfeeding rates.	The Breastfeeding Empowerment Inventory and Breastfeeding Problems Inventory
Franco-Antonio <i>et al.</i> (2021) ^[30]	A randomized, controlled, multicenter, parallel-group clinical trial was carried out	Spain	88	The intervention used in this study is a Brief Motivational Intervention (BMI) based on motivational interviewing to promote breastfeeding among postpartum women.	A positive impact in Preventing Postpartum Depression (PPD) is primarily due to its effectiveness in increasing the duration of breastfeeding.	PPD by the EPDS, Self-Efficacy Scale Short-Form (BSES-SF)
Milenco <i>et al.</i> (2020) ^[31]	A randomized control trial	Spain	44	The “biological nurturing” approach to breastfeeding support.	Significantly reduced the risk of breast problems, including cracked and sore nipples.	Intention-to-Treat Analysis
Saejueng <i>et al.</i> (2022) ^[32]	A randomized control trial	Thailand	120	The participants in the intervention group were given three different treatments: a mixture of a placebo tea with a domperidone tablet, a mixture of a placebo tea with a placebo tablet, and a placebo tablet of Wang Nam Yen herbal tea.	The amount of breast milk produced at 72 h following childbirth.	Randomization ID: A table of random numbers was used to create randomization IDs for participants, which were inserted into opaque envelopes to mask clinicians, data collectors, and patients. These IDs were used to allocate participants into three groups
Sroiwatana and Puapornpong (2018) ^[33]	A randomized controlled trial	Thailand	28	Intervention Group: video teaching, assisted teaching group, and routine teaching group.	Video-assisted breastfeeding teaching.	The LATCH mnemonic scores
Paritakul <i>et al.</i> (2016) ^[34]	A randomized, double-blind, controlled trial	Thailand	63	The use of ginger.	The amount of breast milk produced in 1 h indicates the 24-h milk production.	LATCH score
Cankaya and Ratwisch (2020) ^[35]	A single-blinded, parallel-group randomized controlled trial	Turkey	100	The intervention group had a small pillow under the mother’s knee to prevent fatigue, ensuring the foot receiving the reflexology treatment was kept at a 45° angle.	Enhances the breastfeeding period and improves the postpartum comfort of mothers.	Visual Analog Satisfaction Patient Scale (VASPS), The Breastfeeding Charting System (LATCH)

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Table 1: Contd...

(First Author, Study design Year)	Study design	Location	Participants	Intervention(s)	Outcome	Measurement tools
Yilmaz <i>et al.</i> (2020) ^[36]	Quasi-experimental design	Turkey	60	Intervention Group: (experimental group newborns and mothers; control group newborns and mothers).	Breastfeeding self-efficacy with the perinatal and postnatal interventions.	Breastfeeding Self-Efficacy Scale and the Perception of Insufficient Milk Questionnaire
Varisoglu and Gungor Satilmis (2020) ^[37]	A Randomized Controlled Trial	Turkey	44	Premature infants in the Neonatal Intensive Care Unit (NICU) were separated into the intervention group and the Music Group (MG).	Increased breastmilk production in mothers with premature newborns.	Spielberger’s State-Trait Anxiety Inventory, Turkish Music Research and Promotion Group (TU-MATA)
Dib <i>et al.</i> (2020) ^[38]	Randomized to a control group	United Kingdom	N/A	Breastfeeding meditation audio that mothers of late preterm infants will be asked to listen to daily while breastfeeding.	Reduces maternal stress, infant weight.	Various physiological and behavioral assessments
Ingram <i>et al.</i> (2012) ^[39]	Double-blind randomized controlled trial	United Kingdom	80	Administering either domperidone or metoclopramide to mothers who were expressing breast milk for their infants in the neonatal intensive care unit (NICU) and were not meeting the prescribed target for milk output.	Both oral domperidone and metoclopramide increased the volume of milk produced by mothers who were expressing to feed their babies in the NICU.	Total milk volume and adverse side effects
Albert and Heinrichs-Breen (2011) ^[40]	Quasi-experimental, post-test design	United States	46	The use of a breastfeeding privacy sign during breastfeeding sessions.	Mothers who used the privacy sign reported a higher level of agreement that their breastfeeding sessions were successful.	A Study Feeding Diary and Obstetric Research Study Questionnaire

IG=Intervention Group, CONSORT=Consolidated Standards of Reporting Trials, ThermoCAMTMP30= ThermoCAM Temperature Measurement Profile 30 (thermal imaging camera by FLIR Systems), SSC=Skin-to-Skin Contact, EPDS= Edinburgh Postnatal Depression Scale, ID=Identification or Identifier, LATCH=Latch, Audible swallowing, Type of nipple, Comfort, Hold (breastfeeding assessment tool)

main categories: nutrition provided to mothers, massage given to mothers, educational interventions, and relaxation techniques. These interventions were explored for their effects on various breastfeeding outcomes, including milk production, postpartum comfort, breastfeeding support, maternal self-efficacy, breastfeeding knowledge, duration of breastfeeding, breastfeeding success, and maternal stress levels.

The review findings underscore the significance of early initiation of breastfeeding interventions, particularly within the first month post-birth, to facilitate maternal postpartum adaptation effectively.^[8] Non-pharmacological approaches such as herbs, acupuncture, acupressure, breast care, Oketani massage, and oxytocin massage emerge as promising avenues for enhancing breast milk production during the postpartum period. Studies reveal that the Oketani massage, especially beneficial for mothers undergoing cesarean deliveries, significantly improves various breastfeeding aspects, including infant latch, swallowing frequency, nipple condition, and breastfeeding position. Similarly, oxytocin

massage, administered by partners, positively influences postpartum milk production and maternal comfort.^[9]

Incorporating early and comprehensive breastfeeding interventions such as Oketani massage, oxytocin massage, and hypnobreastfeeding is advocated to significantly enhance breastfeeding outcomes and maternal well-being during the postpartum journey. Healthcare professionals are encouraged to integrate these interventions to empower breastfeeding women, improve nursing and midwifery practices, and enhance maternal and neonatal health outcomes. Within this landscape, therapeutic massages, particularly the Oketani massage, hold significant promise for postpartum mothers, particularly those who underwent cesarean deliveries and face breastfeeding challenges. The Oketani massage positively impacts various breastfeeding aspects, reducing the need for supplemental support. Study results demonstrate higher breastfeeding success rates and frequency in the intervention group than in controls ($p < 0.001$ and $p = 0.002$, respectively).^[10] Additionally, oxytocin

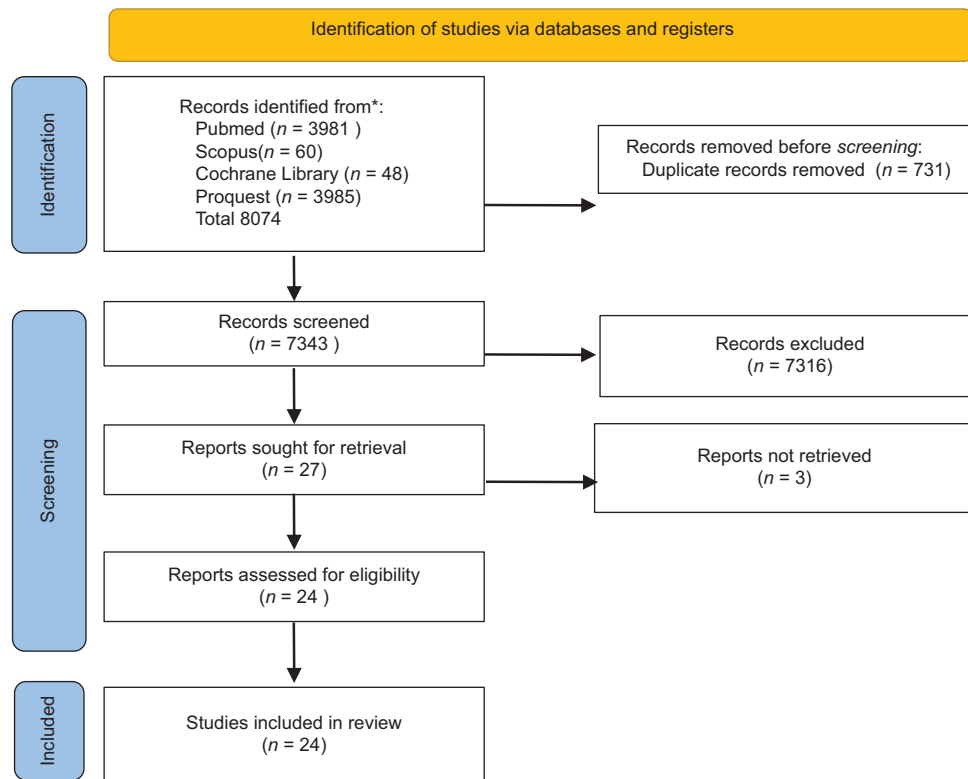


Figure 1: Selection Process Diagram Flow by Authors

massage significantly alters breast milk texture, enhancing postpartum milk production ($p < 0.05$).^[11] Administered by husbands, oxytocin massage stimulates hormone release, improving breastfeeding outcomes and maternal comfort. The multifaceted nature of breastfeeding success involves factors such as feeding frequency, pre-bedtime nutrition, and oxytocin reflex massage application.^[12]

Undoubtedly, early initiation of exclusive breastfeeding emerges as a linchpin for improving neonatal health and survival. Successful breastfeeding hinges upon carefully considering maternal and infant aspects, harmonizing milk production to meet the infant's nutritional requisites. Intriguingly, the research underscores a direct correlation between maternal plasma cortisol levels and cortisol levels within breast milk, elucidating breast milk's reflection of maternal cortisol levels. Notably, cesarean section births correlate with lower breastfeeding initiation rates and exclusive nursing at the 6-month mark, underscoring the imperative for meticulously researched interventions to bolster breastfeeding support.^[13]

In a holistic vein, a study highlights the efficacy of combining hypnosis with acupressure or employing acupressure alone as a comprehensive technique for addressing breastfeeding and milk production challenges. These approaches holistically integrate the body, mind, and soul, addressing neuro-psychiatric, endocrine, and immunological imbalances. The results showcased heightened colostrum expenditure in primiparous mothers

during hypnolactation. Hypnotherapy further elevates oxytocin hormone levels, expediting breast milk release and enhancing comfort by 56%, ultimately amplifying maternal well-being.^[14,15] The positive impact of hypnotic stress reverberates, bolstering breastfeeding confidence, curbing maternal stress, and elevating milk output.

Within the realm of hypnobreastfeeding, a soothing technique, the study administered the intervention twice daily over a week, either in a state of relaxation or accompanied by uplifting music.^[12,16] By adopting a proactive, holistic approach encompassing early interventions, non-pharmacological techniques, and novel strategies like hypnobreastfeeding, nursing, and midwifery professionals play a pivotal role in maternal-newborn well-being.

This study has several limitations that should be acknowledged. First, there is a potential for bias in article selection, as the inclusion criteria and screening process may have inadvertently excluded relevant studies. Second, the reliance on a limited number of databases and the exclusion of non-English publications may have resulted in missing important evidence, thereby limiting the comprehensiveness and generalizability of the findings. Third, the focus on quasi-experimental studies—rather than including a broader range of study designs such as randomized controlled trials—may affect the strength and applicability of the conclusions drawn. Additionally, as a scoping review, this study prioritizes breadth over depth,

which may limit the detailed analysis of intervention effects compared to a systematic review or meta-analysis.

Despite these limitations, the study provides meaningful insights into the effectiveness of breastfeeding interventions and highlights diverse approaches that can inform evidence-based maternal and infant health practices. Future research should consider broadening database coverage, including non-English studies, and prioritizing high-quality experimental designs with larger sample sizes and longer follow-up periods to strengthen the evidence base.

Conclusion

The study findings indicate that implementing various interventions, such as breastfeeding support, massage for mothers, and education, can significantly affect breastfeeding outcomes. Researchers commonly focus on milk production, breastfeeding self-efficacy, and breastfeeding duration to assess the effectiveness of these treatments. These interventions may improve breastfeeding practices and experiences, including increased milk production, enhanced self-confidence, and longer breastfeeding duration. This information is vital for healthcare professionals and policymakers to design effective support programs for new mothers, promoting healthy breastfeeding and benefiting both mothers and newborns.

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Conflicts of interest

Nothing to declare.

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