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# Mobile Health Interventions for Postpartum Maternal Health: An Umbrella Review

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## INTRODUCTION

The postpartum period is widely regarded as a crucial transitional stage in a woman's life, requiring adjustment to multiple physiological, psychological, and social changes. The first six weeks after childbirth are particularly sensitive, as this phase can significantly influence both

maternal recovery and infant health outcomes (1). During this time, mothers frequently report fatigue, sleep disruption, emotional instability, and challenges in maintaining adequate self-care practices.

Globally, postpartum depression is estimated to affect approximately 10–20% of women, with

## Abstract

**Background:** The postpartum period is a critical phase involving physical recovery, emotional adaptation, and social transition, which may affect maternal wellbeing. Limited access to continuous postnatal care can increase the risk of depression, inadequate self-care, and delayed recovery. Mobile health (mHealth) interventions have emerged as a potential solution to support continuity of care through remote monitoring, digital education, and ongoing support.

**Objective:** This review aimed to synthesize evidence on the role of mobile health interventions in improving maternal health outcomes during the postpartum period.

**Methods:** An umbrella review was conducted following the PRISMA 2020 framework. Relevant studies published between 2019 and 2025 were identified from PubMed, Scopus, CINAHL, and ScienceDirect. Eligibility was determined using the PICO framework, focusing on postpartum women receiving mHealth interventions compared to standard care. Five review-level studies were included and analyzed using descriptive and thematic synthesis.

**Results:** mHealth interventions showed potential benefits in improving maternal self-efficacy, self-care engagement, physical activity, and overall wellbeing. They were also associated with reduced postpartum depression symptoms and improved adherence to follow-up care.

**Conclusion:** Mobile health interventions may contribute positively to both psychological and physical health outcomes in postpartum women. However, the available evidence remains limited and indirect. Further high-quality primary studies are needed to establish effectiveness and inform clinical implementation.

**Keywords:** Evidence synthesis; Maternal wellbeing; Mobile health; Postpartum period; Self-care

higher prevalence observed in low- and middle-income countries where access to healthcare services and social support remains limited (2,3). In addition to psychological concerns, postpartum women may also experience various physical health problems, such as delayed recovery, persistent weight retention, and metabolic disturbances. These issues are especially relevant among mothers with a prior history of gestational diabetes mellitus (4). Such complex and interconnected health needs underline the importance of providing continuous and comprehensive postpartum care.

From a nursing perspective, holistic postpartum management involves strengthening self-care behaviors, delivering structured health education, and supporting emotional adaptation during the transition to motherhood (5). However, conventional postpartum care models that rely primarily on short face-to-face consultations may not adequately ensure continuity of care once women return home. Increased workloads among healthcare providers, combined with geographical and logistical barriers, may further contribute to gaps in postnatal service provision.

Recent advances in digital health technology have created new opportunities to improve maternal healthcare delivery. Mobile health (mHealth), defined as the use of mobile devices to support healthcare services and public health practices, has increasingly been adopted to enhance patient engagement, improve access to health information, and facilitate continuity of care (6,7). Through digital platforms, postpartum women can receive individualized education, real-time symptom monitoring, automated reminders, and remote psychosocial support, helping to address limitations associated with traditional postpartum services. In this review, mobile health interventions refer to digital health strategies delivered through mobile or web-based platforms, which may include educational, behavioral, monitoring, or supportive components, with or without direct involvement of healthcare professionals

Despite the growing integration of digital health interventions in maternal care, evidence specifically focusing on mobile health interventions in postpartum populations remains fragmented. Previous studies have often examined broader perinatal populations or general digital interventions, and not all interventions were explicitly nurse-led. In many

cases, postpartum-specific findings are embedded within broader maternal or perinatal evidence. Therefore, there is a need to synthesize existing evidence to better understand the potential role of mobile health interventions in supporting postpartum maternal health outcomes, while acknowledging the variability in intervention characteristics and study populations.

Therefore, this study aimed to synthesize existing evidence on mobile health interventions in postpartum maternal health through an umbrella review approach, focusing on their potential contributions to physical and psychological outcomes among postpartum women.

## METHODS

### Search Strategy

This systematic review was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 recommendations to ensure methodological transparency and rigor. A comprehensive search process was undertaken to identify relevant studies evaluating the effectiveness of mobile health interventions in improving maternal health outcomes during the postpartum period.

Electronic literature searches were performed across four major databases, namely PubMed, Scopus, CINAHL, and ScienceDirect. The search was restricted to articles published between January 2019 and December 2025. In addition to database searching, manual screening of reference lists from selected studies was carried out to maximize the identification of potentially eligible literature. The search strategy incorporated combinations of keywords and Boolean operators such as “mobile health,” “mHealth,” “e-health,” “postpartum,” “nursing,” and “intervention.” Only studies available in English were considered for inclusion.

### Selection Criteria

Eligibility of studies was determined using the Population, Intervention, Comparison, and Outcome (PICO) framework.

### Inclusion Criteria

Studies were included when they focused on postpartum women as the primary population and evaluated digital health interventions such as mobile health or telehealth implemented or

facilitated by nurses. Eligible interventions were those designed to improve either physical or psychological maternal health outcomes during the postpartum period. Comparison groups consisted of women receiving routine postpartum care, standard clinical management, or no structured digital intervention. Outcomes of interest included self-care practices, self-efficacy, physical activity, depressive symptoms, overall wellbeing, and adherence to recommended postpartum clinical follow-up. A range of study designs was considered eligible, including randomized controlled trials, quasi-experimental studies, observational studies, and systematic reviews relevant to postpartum mobile health interventions.

### **Exclusion Criteria**

Studies were excluded if they did not specifically involve postpartum populations or if nursing professionals were not actively involved in the delivery of the digital intervention. Publications such as research protocols, editorials, commentaries, and conference abstracts were also omitted. Furthermore, studies lacking accessible full text or failing to report measurable maternal health outcomes relevant to the objectives of this review were not included in the final analysis.

### **Screening and Study Selection**

The selection of studies was conducted through several sequential stages. Duplicate records identified across databases were removed prior to the screening process. Titles and abstracts were then assessed to determine their relevance to the research question. Articles meeting the predefined eligibility criteria were subsequently retrieved for full-text review. To reduce the risk of selection bias, two independent reviewers performed the screening process, and any discrepancies were resolved through discussion until consensus was reached. The overall study selection procedure was illustrated using a PRISMA flow diagram.

### **Quality Assessment**

The methodological rigor of included studies was evaluated using standardized critical appraisal tools appropriate to each study design. The Critical Appraisal Skills Programme (CASP) checklist was applied to systematic reviews and qualitative research, while quantitative studies

were assessed using instruments developed by the Joanna Briggs Institute (JBI). Only studies demonstrating at least moderate methodological quality and a low risk of bias were retained for synthesis.

### **Data Extraction and Synthesis**

Relevant data were extracted using a structured form to ensure consistency across studies. Extracted information included author details, year of publication, country of study, research design, characteristics of the study population, description of the mobile health intervention, and reported maternal health outcomes.

Given the heterogeneity in intervention characteristics, outcome measures, and methodological approaches, a statistical meta-analysis was not feasible. Therefore, study findings were synthesized using descriptive and thematic approaches to identify common patterns in intervention components and their influence on physical and psychological outcomes among postpartum women.

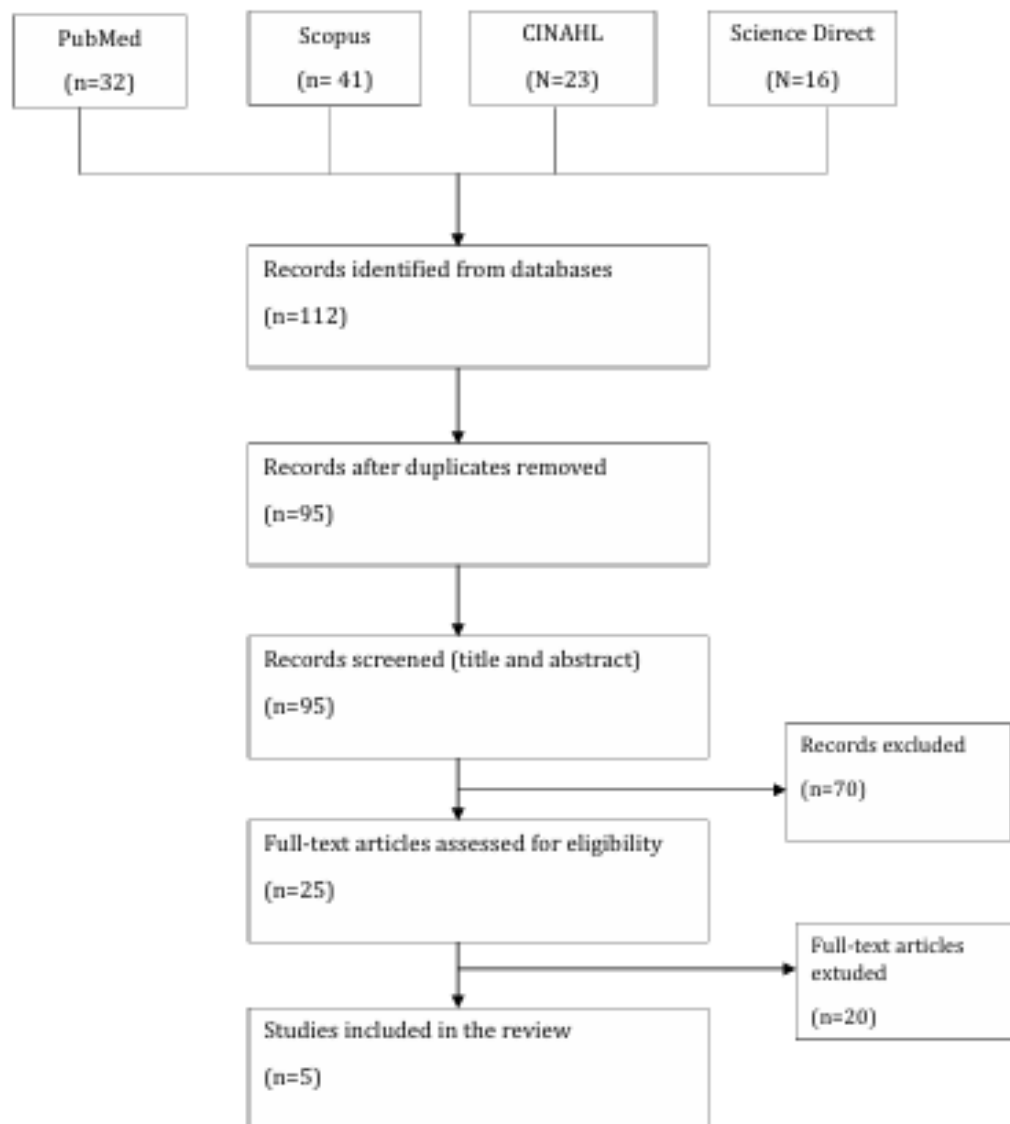
## **RESULTS**

### **Study Selection**

The initial database search across four electronic sources yielded a total of 112 potentially relevant records. After duplicate entries were removed, 95 articles remained for title and abstract screening. At this stage, 70 studies were excluded as they did not meet the predefined eligibility criteria, primarily due to the inclusion of non-postpartum populations, use of primary study designs, or lack of relevant maternal health outcomes.

Subsequently, 25 full-text articles were assessed in detail to determine their suitability for inclusion. Of these, 20 studies were excluded due to inappropriate study design (e.g., primary studies), insufficient description of interventions, or lack of extractable postpartum-specific outcomes.

Ultimately, five review-level studies (systematic reviews, scoping reviews, and meta-analyses) were included in the final synthesis. No primary studies were included, as this review was designed as an umbrella review focusing on secondary evidence. The overall study selection process is summarized in the PRISMA flow diagram.



**Figure 1. PRISMA flow diagram**

### **Characteristics of Included Studies**

The five included studies comprised systematic reviews, scoping reviews, and systematic reviews with meta-analysis. Study included both postpartum-only populations and broader perinatal populations, with postpartum-specific findings extracted where available. Not all included studies specifically focused on nurse-led interventions; rather, the interventions represented a range of digital health strategies with varying levels of healthcare professional involvement.

Across the selected studies, interventions included digital education, remote monitoring, automated reminders, telecoaching, and clinical follow-up tracking. Reported outcomes covered self-care practices, self-efficacy, physical activity, depressive symptoms, wellbeing, and adherence to recommended postpartum clinical follow-up.

### **Synthesis of Findings**

Mobile health interventions were associated with improvements across several domains of maternal health. In terms of psychological

outcomes, interventions incorporating psychoeducation, mood tracking, and virtual support were linked to potential reductions in depressive symptoms and improved emotional wellbeing. However, much of this evidence was derived from broader perinatal populations rather than postpartum-only samples.

Regarding physical and lifestyle outcomes, telecoaching and activity-tracking interventions were associated with increased physical activity and improved weight management. Nevertheless, these findings were primarily based on mixed populations, limiting their specificity to postpartum women.

In addition, mobile health strategies that integrated education and monitoring components appeared to enhance maternal self-efficacy and engagement in self-care practices.

Interactive communication features were particularly important in supporting behavioral changes, although the strength of evidence remains indirect due to the review-level nature of the included studies.

Furthermore, digital monitoring tools and reminder systems were associated with improved adherence to recommended postpartum follow-up, especially among women with metabolic risk factors. However, this evidence was not exclusively derived from postpartum-specific studies.

Overall, the findings suggest potential benefits of mobile health interventions; however, the evidence remains limited, heterogeneous, and largely indirect.

**Table 1. Quality Appraisal of Included Studies**

| Study                 | Study Design                      | Appraisal Tool | Overall Quality |
|-----------------------|-----------------------------------|----------------|-----------------|
| Han et al. (2025)     | Systematic Review                 | CASP           | High            |
| Dosani et al. (2020)  | Scoping Review                    | CASP           | Moderate        |
| Yao et al. (2025)     | Systematic Review & Meta-analysis | CASP           | High            |
| Mertens et al. (2019) | Systematic Review                 | CASP           | High            |
| Garg et al. (2022)    | Systematic Review                 | CASP           | High            |

**Table 2. Summary of Included Studies**

| Author (Year)         | Study Design                      | Population                    | Mobile Health Intervention                         | Main Outcomes                        |
|-----------------------|-----------------------------------|-------------------------------|--|--------------------------------------|
| Han et al. (2025)     | Systematic review                 | Pregnant and postpartum women | Digital education and monitoring                   | Improved self-efficacy and wellbeing |
| Dosani et al. (2020)  | Scoping review                    | Perinatal women               | Mobile health application for depression screening | Reduced depressive symptoms          |
| Yao et al. (2025)     | Systematic review & meta-analysis | Pregnant and postpartum women | Activity tracking intervention                     | Increased physical activity          |
| Mertens et al. (2019) | Systematic review                 | Postpartum women              | Telecoaching lifestyle intervention                | Improved weight management           |
| Garg et al. (2022)    | Systematic review                 | Women with history of GDM     | Clinical monitoring application                    | Improved follow-up adherence         |

## DISCUSSION

This review synthesized available evidence regarding the potential role of mobile health interventions in supporting maternal outcomes during the postpartum period. Overall, the findings suggest that mobile health approaches may offer supportive benefits in facilitating postpartum recovery, particularly in relation to self-care, psychological wellbeing, and selected physical health outcomes. However, these findings should be interpreted with caution given the nature of the included evidence.

One of the most consistently reported findings across the included studies was the improvement in maternal self-efficacy and health-related knowledge. Interventions incorporating digital education and ongoing communication appeared to enhance women's understanding of postpartum health and support engagement in self-management behaviors. These observations are consistent with broader theoretical perspectives that emphasize the importance of patient empowerment and self-care capacity in maternal health (5). However, it is important to note that such findings were not exclusively derived from postpartum-only populations and were often reported within broader perinatal contexts.

Mobile health interventions were also associated with potential improvements in psychological wellbeing, including reductions in depressive symptoms and enhanced emotional support. Digital platforms offering psychoeducation, symptom monitoring, and remote support may facilitate earlier identification of psychological distress. These findings are consistent with existing literature highlighting the importance of accessible mental health support during the postpartum and perinatal periods (2,3,8). Nevertheless, the majority of this evidence originates from review-level studies and does not consistently isolate postpartum-specific effects.

With regard to physical and behavioral outcomes, interventions such as telecoaching and activity-tracking applications were associated with improvements in physical activity and weight management (10,12). In addition, digital monitoring tools appeared to support adherence to recommended clinical follow-up, particularly among women with metabolic risk factors such as a history of gestational diabetes mellitus (11). However, these findings were largely derived from heterogeneous populations, including both

pregnant and postpartum women, which limits the specificity of conclusions for postpartum care.

While several studies discussed the involvement of healthcare professionals in delivering mobile health interventions, the extent to which these interventions were consistently nurse-led remains unclear across the included evidence (9,13). As such, attributing the observed benefits specifically to nursing-led interventions should be approached cautiously. Instead, the findings more broadly reflect the potential of digitally supported care models that may involve multidisciplinary healthcare input (14-16).

From a health systems perspective, mobile health strategies may offer a promising complementary approach to enhance continuity of care, particularly in settings where access to postpartum services is limited. Digital platforms have the potential to improve access to health information, support remote monitoring, and facilitate ongoing communication between women and healthcare providers (17-20). However, the practical implementation of such interventions requires further evidence, particularly from primary studies evaluating effectiveness in real-world postpartum settings.

### Implications

Mobile health interventions can serve as a complementary strategy to conventional postpartum care, particularly by enhancing continuity of care, improving maternal self-management, and facilitating early detection of psychological distress. For nursing practice, these findings highlight the potential role of digital platforms in strengthening patient education, monitoring, and follow-up support beyond clinical settings. However, implementation should be approached cautiously, as stronger evidence from postpartum-specific primary studies is still needed to guide large-scale integration into routine care.

### Limitation

Several important limitations should be acknowledged. First, the included studies were exclusively review-level evidence, including systematic reviews, scoping reviews, and meta-analyses. As a result, the findings represent secondary and indirect evidence rather than primary intervention outcomes. Second, considerable heterogeneity was observed across studies in terms of population, intervention

characteristics, outcome measures, and study design. Third, overlap of primary studies across included reviews may have influenced the synthesis. Finally, many studies included broader perinatal populations, limiting the ability to draw conclusions specific to postpartum women.

Future research should focus on generating high-quality primary evidence, particularly randomized controlled trials that specifically target postpartum populations. In addition, clearer reporting regarding the role of healthcare providers, including nurses, in delivering mobile health interventions is needed. Further work is also required to evaluate the long-term sustainability, cultural adaptability, and real-world feasibility of mobile health strategies in postpartum care.

## CONCLUSION

Current evidence suggests that mobile health interventions may offer potential benefits in supporting maternal health outcomes during the postpartum period, particularly in relation to self-care, psychological wellbeing, physical activity, and adherence to clinical follow-up. However, these findings should be interpreted with caution, as the available evidence is limited, heterogeneous, and largely derived from review-level studies rather than primary intervention trials.

In addition, not all included studies specifically focused on postpartum populations or clearly defined healthcare provider involvement, which further limits the specificity of conclusions. As such, while mobile health approaches appear promising as a supportive component of postpartum care, firm conclusions regarding their effectiveness cannot yet be established.

Future research should prioritize well-designed primary studies, particularly randomized controlled trials that specifically target postpartum populations. Further investigation is also needed to evaluate the long-term sustainability, contextual adaptability, and real-world feasibility of mobile health interventions before broader implementation in routine postpartum care can be recommended.

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## Author Contributions

F.A.R. conceptualized the study, conducted the literature search, performed data screening and extraction, and drafted the manuscript. F.B.R. supervised the study, contributed to methodological refinement, data interpretation, and critically revised the manuscript. Both authors reviewed and approved the final version of the manuscript.

## Conflict of Interest

The authors declare no financial, personal, or professional conflicts of interest related to this study.

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