

Research Article

The Impact of Mobile Application–Based Interventions on Postpartum Depression: A Systematic Review

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Abstract

This systematic review aimed to evaluate the effectiveness of mobile application–based interventions in the prevention and management of postpartum depression and related mental health outcomes. Randomized controlled trials and quasi-experimental studies published between 2020 and 2025 were reviewed. The included studies involved postpartum women and examined mobile health interventions such as smartphone applications, chatbots, and AI-based counseling platforms. Validated measurement tools, including EPDS, PHQ-9, GAD-7, STAI, PSI, and PSOC, were used to assess mental health, parenting stress, and self-efficacy outcomes. Five studies met the inclusion criteria, comprising a total of 457 postpartum women. Three studies reported statistically significant reductions in depressive symptoms among participants using mobile-based interventions compared to standard care. Two studies demonstrated significant improvements in parenting stress and self-efficacy. One study found no significant effect on anxiety levels, while another reported mixed findings, with improvements observed in PHQ-9 scores but not in EPDS or GAD-7 scores. Overall, mobile-supported interventions were associated with positive effects on maternal mental health, particularly in reducing depressive symptoms and enhancing parenting competence. Mobile application–based interventions appear to be effective tools for supporting maternal mental health during the postpartum period. Their accessibility, cost-effectiveness, and ability to provide continuous support make them promising complementary approaches to standard postpartum care. However, further large-scale, high-quality randomized controlled trials are needed to strengthen the evidence base and determine long-term effectiveness.

Keywords: *Postpartum Depression; Mobile Applications; mHealth; Maternal Mental Health; Nursing Care; Digital Health*

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1. Introduction

The postpartum period is an important process that begins with the birth of the baby and affects the family biologically, physiologically, and psychosocially (Biaggi et al., 2016; Ferber, 2004). During this period, the risk of various psychiatric disorders increases, particularly among women who have recently given birth. Postpartum depression is a serious psychiatric disorder that is commonly observed in the perinatal period and can lead to significant morbidity and mortality for both mothers and infants (Hahn-Holbrook et al., 2017).

Postpartum depression usually emerges within the first twelve weeks after childbirth and negatively affects women's quality of life (Dennis & Dowswell, 2013). Systematic reviews have identified statistically significant risk factors for postpartum depression, including domestic violence, a history of psychiatric disorders, daily life stressors, low socioeconomic status, and insufficient social and spousal support (Fisher et al., 2012).

In recent years, the use of mobile health applications during the postpartum period has become increasingly widespread. These applications stand out for their supportive and educational features (Alrida & Hayjneh, 2025; Gerçek Öter & Kocademir, 2020; Li et al., 2025; Miura et al. 2023). Their accessibility, low cost, and reliability facilitate access to healthcare services and contribute to higher usage rates (Özbek et al., 2023). In this context, mobile applications are gaining increasing importance due to their potential role in the prevention and management of postpartum depression.

Widely used mobile applications provide mothers with accessible, evidence-based care guidelines. In the nursing care process, these applications enhance the quality and efficiency of patient care by offering supportive, complementary, and easily understandable content (Zhou et al., 2020). This review aims to examine, based on evidence, the relationship between the effectiveness of mobile applications and their role in the prevention and management of postpartum depression.

2. Methodology

2.1. Search Strategy

A literature search was conducted between October and December 2025 in PubMed, Scopus, Web of Science, and the Cochrane Library databases. The search covered studies published between 2020 and 2025 and included articles in English. Both MeSH terms and English keywords were used: 'Postpartum Depression,' 'Mobile Health,' 'Mental Health,' and 'Mobile Applications

2.2. Eligibility Criteria (PICOS)

Studies were selected based on predefined inclusion criteria using the PICOS framework (Centre for Review and Dissemination, 2008) (Table 1). Titles, abstracts, and keywords were initially screened, and full texts of eligible studies were examined in detail. Studies unrelated to the review or duplicate articles were excluded.

2.3. Study Selection

A total of 4273 records were identified through the literature search. After a rigorous screening process, five studies met the inclusion criteria and were included in the systematic review. The study selection process is presented using the PRISMA flow diagram (Figure 1). The protocol for this systematic review

adhered to the PRISMA-P guidelines (Haddaway et al., 2020) and was registered in PROSPERO (registration number: CRD420261297048). All steps of study selection were independently reviewed by the authors, and disagreements were resolved by consensus.

2.4. Data Extraction

Data were extracted using a standardized form that included: author(s) and year, country, study design, sample size and characteristics, intervention or exposure, chronobiological rhythm parameter or other measurements, main findings, and JBI quality score.

2.5. Quality Assessment

The methodological quality of the included studies was independently assessed by all researchers using the Joanna Briggs Institute (JBI) critical appraisal tools (Barker et al., 2023). Cohort studies were evaluated with an 11-item tool (score 0–11), prospective pilot studies with a 10-item tool (score 0–10), and randomized controlled trials with a 13-item tool (score 0–13). For each item, “yes” responses were scored as 1 point, while “no,” “not specified,” and “not applicable” responses were scored as 0 points. High scores indicate higher methodological quality. In this review, scores ranged from 9 to 10, corresponding to medium to high quality.

Figure 1. PRISMA Flow Chart of the Screening Process

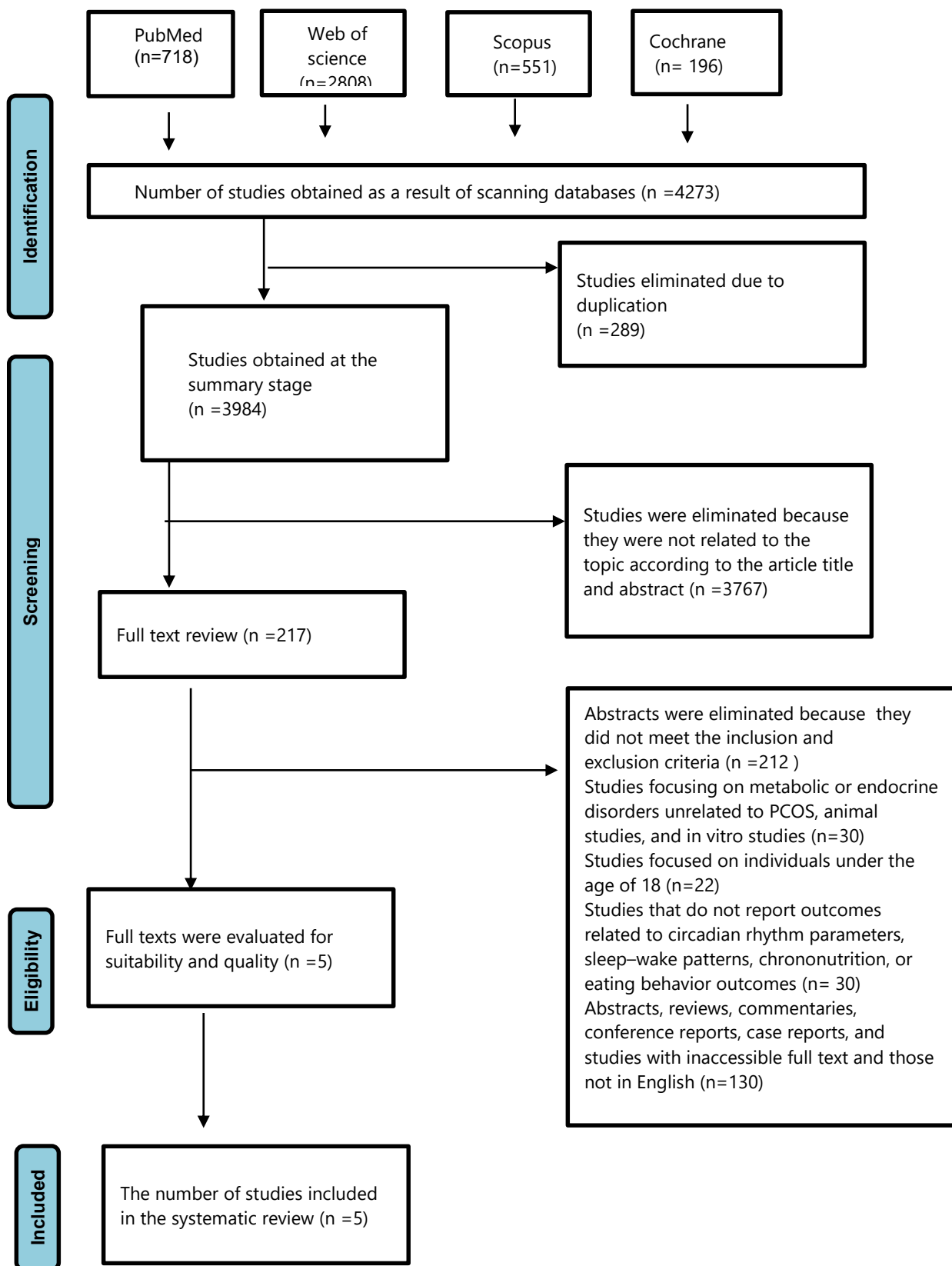


Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
P (Population): Included postpartum women, Implemented a mobile application-based intervention	Did not include postpartum women as participants a mobile health or digital intervention
I (Intervention/Exposure):	
C (Comparison): Focused on the prevention or management of postpartum depression, anxiety, parenting stress, or maternal mental health	–
O (Outcome):	
S (Study Design): Full-text accessible English prospective cohort or randomized controlled trials	Reviews, meta-analyses, editorials, conference abstracts, studies with inaccessible full text, and non-English studies

Table 2. Characteristics, main findings, and methodological quality of studies included

Study (Author, Year, Country)	Design – Method – Sample	Measurement Tools	Main Findings	JBI
Kleebpan et al. (2025), Thailand	Quasi-experimental study with matched control group design. Sample: 60 adolescent postpartum women aged 15–19 years (30 intervention, 30 control). The intervention group received two educational sessions before discharge and weekly follow-ups via the Line Official Account™ mobile application for 6 weeks.	Edinburgh Postnatal Depression Scale (EPDS); Parenting Stress Index–Short Form (PSI-4-SF); Parenting Sense of Competence Scale (PSOC)	Adolescent mothers who participated in the mobile application–supported parenting program had significantly lower parenting stress and significantly higher parenting self-efficacy (confidence) compared to the control group receiving standard care. The results demonstrate that such technological interventions facilitate adolescent mothers' transition to motherhood.	9
Osman et al. (2025) Japan	This randomized controlled trial (RCT) was conducted with a total of 130 low-risk postpartum women living in the Kanagawa region of Japan (65 in the intervention group and 65 in the control group). Participants were divided into two groups. The intervention group received telenursing support and educational content through a smartphone application called "Smart Mama," while the control group continued to receive standard care. Data were collected and followed up until the 12th week postpartum.	Edinburgh Postnatal Depression Scale (EPDS) State-Trait Anxiety Inventory (STAI) Mother-to-Infant Bonding Scale (MIBS)	It was found that women in the intervention group who used the "Smart Mama" application had significantly lower depression and anxiety scores compared to those in the control group.	10

Kerimoğlu Yıldız et al. (2025) Türkiye	This study employed a quasi-experimental design and was conducted with 60 mothers who gave birth in the maternity ward of a public hospital (30 in the AI group and 30 in the booklet group). Participants were divided into two groups: one group received an artificial intelligence (AI)-based mobile breastfeeding counseling application, while the control group was provided with an informational booklet. Mothers were followed up on postpartum days 1, 3, 7, and 10.-	LATCH Breastfeeding Assessment Tool; Postpartum Breastfeeding Self-Efficacy Scale; Beck Anxiety Inventory (BAI)	No statistically significant difference was found between the groups in terms of anxiety levels.	9
Suharwardy et al. (2023) – ABD	This study was designed as a randomized controlled trial and was completed by 152 women (68 in the chatbot group and 84 in the control group). Participants were allocated in a 1:1 ratio to either the “chatbot (Woebot) + routine care” group or the “routine care only” (control) group. The intervention group used a smartphone application providing content based on cognitive behavioral therapy (CBT) and interpersonal psychotherapy (IPT) during the first six weeks postpartum. Questionnaires were	PHQ-9 (Patient Health Questionnaire-9) EPDS (Edinburgh Postnatal Depression Scale) GAD-7 (Generalized Anxiety Disorder-7) CSQ-8 (Client Satisfaction Questionnaire) WAI-SR (Working Alliance Inventory-Short Revised)	At the end of the study, a statistically significant reduction in PHQ-9 scores was observed in the chatbot group compared to the control group at week 6. However, no significant differences were found between the groups in terms of EPDS and GAD-7 scores.	9

Qin et al. (2022) China	administered at baseline in the hospital and at weeks 2, 4, and 6. This study was conducted as a pilot randomized controlled trial. A total of 105 mothers completed the study (CareMom group: 57; control group: 55). Participants were enrolled during their postpartum hospital stay within the first three days after delivery and were randomly assigned to either the "CareMom" application group or the wait-list control group. The intervention group completed 28-day challenges consisting of psychoeducational videos and short quizzes via the "CareMom" application over a four-week period. The control group received routine postpartum care only and completed weekly questionnaires.	EPDS (Edinburgh Postnatal Depression Scale) GAD-7 (Generalized Anxiety Disorder-7)	At the end of week 4, depression (EPDS) scores in the CareMom group were found to be significantly lower than those in the control group.	9
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3. Results

Kleebran et al. (2025) conducted a quasi-experimental study in Thailand using a matched control group design. The sample consisted of 60 adolescent postpartum women aged 15–19 years (30 in the intervention group and 30 in the control group). Data were collected using the Edinburgh Postnatal Depression Scale (EPDS), Parenting Stress Index–Short Form (PSI-4-SF), and Parenting Sense of Competence Scale (PSOC). The intervention group received two educational sessions prior to hospital discharge and was subsequently followed weekly for six weeks via the Line Official Account™ mobile application. This program aimed to address contextual stress and support resources, identifying nurses as key facilitators in helping adolescent mothers care effectively for their children. The Line Official Account™ platform provided continuous support and timely responses to participants' questions. The results showed that adolescent mothers who participated in the mobile-supported parenting program had significantly lower parenting stress and significantly higher parenting self-efficacy compared to those receiving standard care.

Osman et al. (2025) conducted an open-label, parallel-group randomized controlled trial titled "The Effectiveness of the Smart Mama Application on Postpartum Depression, Anxiety, and Mother–Infant Bonding Among Women in the Kanagawa region of Japan." The study included 130 low-risk postpartum women (65 in the intervention group and 65 in the control group). The Edinburgh Postnatal Depression Scale (EPDS), State-Trait Anxiety Inventory (STAI), and Mother-to-Infant Bonding Scale (MIBS) were used for data collection. Participants were assigned to either an intervention group receiving telenursing support and educational content through the "Smart Mama" smartphone application or a control group receiving standard care. Participants were followed until 12 weeks postpartum. The findings indicated that women in the intervention group had significantly lower depression and anxiety scores compared to the control group.

Kerimoğlu Yıldız et al. (2025) conducted a quasi-experimental study in Turkey (İskenderun and Kars) titled "Artificial Intelligence–Supported Chatbot: Its Effect on Breastfeeding Outcomes and Maternal Anxiety." The sample consisted of 60 primiparous mothers, including 30 in the experimental group who used an AI-supported chatbot and 30 in the control group who received a standard educational booklet. Data were collected using a Personal Information Form, LATCH Breastfeeding Assessment Tool, Postpartum Breastfeeding Self-Efficacy Scale, and Beck Anxiety Inventory (BAI). Participants were assigned to either the AI-based mobile breastfeeding counseling group or the booklet group and were followed on postpartum days 1, 3, 7, and 10. The results revealed no statistically significant differences between groups in terms of anxiety levels.

Suharwardy et al. (2023) conducted a randomized controlled trial titled "Feasibility and Effectiveness of a Mental Health Chatbot on Postpartum Mental Health" in the United States. A total of 192 women aged 18 years and older who owned a smartphone, spoke English, and had a live birth were randomized, and 152 participants completed the study (68 in the chatbot group and 84 in the control group). Data were collected using the Patient Health Questionnaire-9 (PHQ-9), Edinburgh Postnatal Depression Scale (EPDS), Generalized Anxiety Disorder-7 (GAD-7), Client Satisfaction Questionnaire (CSQ-8), and Working Alliance Inventory–Short Revised (WAI-SR). Participants were assigned in a 1:1 ratio to either the "chatbot (Woebot) + routine care" group or the "routine care only" group. The intervention group used a smartphone application providing cognitive behavioral therapy (CBT) and interpersonal psychotherapy (IPT)-based content for six weeks postpartum. Assessments were conducted at baseline and at weeks 2, 4, and 6. At week 6, PHQ-9 scores were significantly lower in the chatbot group, while no significant differences were observed in EPDS and GAD-7 scores.

Qin et al. (2022) conducted a pilot randomized controlled trial in China titled "An App-Based Cognitive Behavioral Therapy Program to Prevent Early Postpartum Depression." Initially, 112 eligible mothers were

randomized (CareMom: 57; Control: 55), and 105 participants completed the study. Data were collected using the Edinburgh Postnatal Depression Scale (EPDS), Generalized Anxiety Disorder-7 (GAD-7), and an Acceptability and Usability Questionnaire. Participants were enrolled during their postpartum hospital stay within the first three days after delivery and were randomly assigned to either the “CareMom” application group or the wait-list control group. The intervention group completed 28-day challenges consisting of psychoeducational videos and short quizzes over a four-week period, while the control group received routine clinical care and completed weekly surveys. At the end of week 4, EPDS scores were significantly lower in the CareMom group compared to the control group.

4. Discussion

In this systematic review, the effects of mobile application-based interventions on postpartum depression and related mental health outcomes were examined. Across the five included studies, the majority of findings demonstrated that mobile health applications are effective in supporting mothers’ psychological well-being during the postpartum period. In particular, mobile applications appear to contribute positively to reducing depressive symptoms, lowering parenting stress, and enhancing perceptions of self-efficacy.

With the advancement of technology, nursing care is becoming increasingly digitalized, and mobile applications are emerging as one of the closest sources of support for mothers in coping with postpartum depression. In the study by Kleebspan et al. (2025), it was reported that adolescent mothers who participated in a mobile application-supported parenting program experienced reduced parenting stress and increased levels of self-efficacy. This finding suggests that digital support systems may play a significant role in helping young mothers adapt to motherhood. Similarly, Osman et al. (2025) demonstrated that telenursing support delivered through the *Smart Mama* application significantly reduced levels of depression and anxiety. These results indicate that mobile applications not only provide information but also positively influence mental health by offering continuous professional support. While postpartum depression may progress silently during one of the most vulnerable periods of motherhood, mobile applications can be viewed as an always-accessible digital source of support for women in this invisible struggle. With the rapid development of technology, mobile health applications have become an integral part of nursing care, offering an innovative approach to the prevention and management of postpartum depression.

In the study by Suharwardy et al. (2023), chatbot-based intervention resulted in a significant decrease in PHQ-9 scores; however, no significant differences were observed in EPDS and GAD-7 scores. This discrepancy may be related to the sensitivity of the measurement tools used and the scope of the intervention. While the PHQ-9 measures general depressive symptoms, the EPDS focuses specifically on postpartum symptoms, which may explain the differences in outcomes. Similarly, in the study by Kerimoğlu Yıldız et al. (2025), no significant change was observed in anxiety levels. These findings suggest that mobile applications may not produce the same level of effect in every individual and may be associated with personal, cultural, and contextual factors.

In the pilot study by Qin et al. (2022), mothers using the *CareMom* application showed a significant reduction in EPDS scores. This finding supports the effectiveness of structured psychoeducation and cognitive behavioral therapy-based programs implemented during the early postpartum period in preventing depression. The literature also reports that digitally delivered psychoeducation and CBT interventions are effective in reducing depressive symptoms (Dennis & Dowswell, 2013; Hahn-Holbrook et al., 2017).

Overall, the studies included in this review suggest that mobile applications play an important complementary role in postpartum care due to their accessible, low-cost, and continuous support features. Particularly in regions where access to healthcare services is limited, such digital solutions offer an effective alternative for protecting maternal mental health (Gerçek Öter & Kocademir, 2020; Li et al., 2025; Özbek et al., 2023). Furthermore, the supportive role of mobile applications in nursing care contributes to improving the quality of care (Zhou et al., 2020).

5. Conclusion

In conclusion, this systematic review demonstrates that mobile application-based interventions offer promising outcomes in the prevention and management of postpartum depression. The integration of digital health applications into nursing and postpartum care services may represent an important strategy for supporting maternal mental health. However, further research is needed to investigate the long-term effects of these applications and their effectiveness across diverse sociocultural groups.

Limitations

Nevertheless, several limitations were identified across the included studies. The relatively small sample sizes, the pilot nature of some studies, and the short follow-up periods limit the generalizability of the findings. In addition, variations in the content, duration, and intensity of the interventions make it difficult to compare outcomes across studies. Therefore, future randomized controlled trials with larger sample sizes, longer follow-up periods, and standardized interventions are essential.

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