INDEX COPERNICUS INTERNATIONAL

E-ISSN - 2477-6521
Vol 11 (2) June 2026 (26-45)

Jurnal Endurance : Kajian Ilmiah Problema Kesehatan
Avalilable Online http://ejournal.kopertis10.or.id/index.php/endurance

MINDFULNESS-BASED INTERVENTIONS FOR PERINATAL MATERNAL MENTAL HEALTH: A SYSTEMATIC REVIEW

Ni Nyoman Widiasih[1*], Ni Wayan Armini[2], Ni Made Dwi Purnamayanti[3]
[1]Midwifery Department, Poltekkes Kemenkes Denpasar
[*]Correspondence email: nyomanwidiasih7@gmail.com
[2]Midwifery Department, Poltekkes Kemenkes Denpasar
Email: amiarmini81@gmail.com
[3]Midwifery Department, Poltekkes Kemenkes Denpasar
Email: purnamayanti.dwi80@gmail.com

Submitted: 24-05-2026, Reviewed: 01-06-2026, Accepted: 06-06-2026
DOI: http://doi.org/10.22216/jen.v11i2.3569

ABSTRACT

Maternal mental health problems during the perinatal period remain a significant global health concern due to their impact on maternal well-being, pregnancy outcomes, and infant development. Mindfulness-based interventions have increasingly been used as non-pharmacological approaches to improve psychological well-being among pregnant and postpartum women. This systematic review aimed to analyze the effectiveness of mindfulness-based interventions for perinatal maternal mental health. The review used a systematic literature review design with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach. Literature searches were conducted through Google Scholar, ScienceDirect, PubMed, and SpringerLink for articles published from 2021 to April 2026. A total of 13 studies met the inclusion criteria. The reviewed studies mainly consisted of randomized controlled trials evaluating mindfulness counseling, mindfulness-based childbirth and parenting programs, meditation, relaxation techniques, and digital mindfulness interventions. Overall, mindfulness-based interventions demonstrated positive effects in reducing anxiety, depression, stress, pregnancy-related distress, and fear of childbirth. Several studies also reported improvements in emotional well-being, childbirth satisfaction, mindfulness awareness, maternal–fetal attachment, and breastfeeding self-efficacy. Mindfulness-based interventions represent effective complementary approaches for improving perinatal maternal mental health, particularly in reducing psychological distress and enhancing maternal emotional well-being during pregnancy and postpartum.

Keywords*: anxiety; mindfulness; pregnancy; postpartum*

INTRODUCTION

The perinatal period, which includes pregnancy and the postpartum phase, is a crucial transition period in a woman's life that involves major physiological, hormonal, emotional, and social changes (Amarin et al., 2025).

During this phase, women experience substantial adjustments related to maternal identity, physical adaptation, family roles,

and preparation for childbirth and parenting. These changes may increase women's vulnerability to psychological disturbances, particularly anxiety, stress, depression, and fear of childbirth. Maternal mental health problems during the perinatal period have become a major global public health concern. Recent evidence indicates that the pooled prevalence of antenatal depression reached 23.3%, while postpartum depression accounted for 21.1% globally (Pan et al., 2024). In addition, the World Health Organization (WHO) reported that approximately 10% of pregnant women and 13% of postpartum women experience mental health disorders worldwide, primarily depression and anxiety. These conditions may negatively affect maternal well-being, neonatal outcomes, and long-term child development (World Health Organization, 2022). Consequently, improving maternal mental health during pregnancy and postpartum has become a global priority in maternal and child health services.

Globally, the prevalence of perinatal mental health disorders continues to increase and affects a substantial proportion of pregnant women. Previous studies reported that approximately 15%–25% of women experience psychological distress during pregnancy (Hulsbosch et al., 2023). A meta-analysis conducted in low- and middle-income countries demonstrated that the prevalence of self-reported anxiety symptoms reached 29.2% during pregnancy and 24.4% during the postpartum period. In addition, depressive symptoms during pregnancy are estimated to affect approximately 10%–25% of pregnant women worldwide. The prevalence of perinatal depression in China alone was reported to reach 16.3%, with antenatal depression accounting for 19.7% and postpartum depression accounting for 14.8% (Wang et al., 2023). These findings indicate that psychological disturbances during the perinatal period remain highly prevalent across different countries and populations.

Anxiety and depression during pregnancy may arise from multiple contributing factors, including hormonal fluctuations, physical discomfort, uncertainty regarding childbirth, concerns about infant health, financial burden, social pressure, and changes in family dynamics (Răchită et al., 2023). Pregnant women, especially primiparous mothers, frequently experience fear related to labor pain, childbirth complications, parenting responsibilities, and changes in personal identity. Fear of childbirth itself has become a common psychological concern among pregnant women worldwide. A systematic review cited in previous studies found that approximately 14% of pregnant women experienced fear of childbirth globally (Wang et al., 2023). High levels of fear and anxiety during pregnancy may negatively affect women's confidence in childbirth and contribute to the increasing preference for cesarean delivery.

Maternal mental health disorders during the perinatal period are associated with various adverse maternal and neonatal outcomes (Dubey et al., 2025). Several studies reported that prenatal anxiety and depression are linked to pregnancy-induced hypertension, preterm birth, low birth weight, impaired maternal functioning, and poor quality of life. In addition, maternal psychological distress may interfere with mother–infant bonding, breastfeeding practices, emotional responsiveness, and parenting adaptation during the postpartum

period. Children born to mothers experiencing persistent psychological distress are also at greater risk of emotional, behavioral, and developmental problems later in life. Therefore, early identification and effective management of maternal mental health problems are essential to improve both maternal and infant outcomes (Hassdenteufel et al., 2023).

Despite the high prevalence and serious consequences of perinatal mental health disorders, many pregnant women still do not receive adequate psychological support or treatment. Mental health care during pregnancy is often underrecognized due to limited resources, social stigma, lack of awareness, and restricted access to mental health services. In many healthcare settings, maternal care remains more focused on physical and obstetric conditions, while psychological well-being receives less attention (Ernst et al., 2025). Additionally, pharmacological treatment during pregnancy may raise concerns regarding fetal safety and potential side effects, causing some women to avoid medication-based therapies. Consequently, there is increasing interest in safe, accessible, and non-pharmacological interventions to support maternal mental health during the perinatal period (Park et al., 2025).

One non-pharmacological approach that has gained increasing attention in recent years is mindfulness-based intervention (MBI). Mindfulness is commonly defined as the ability to intentionally pay attention to present-moment experiences in a non-judgmental and accepting manner. Mindfulness-based interventions generally incorporate meditation practices, breathing exercises, body awareness, relaxation techniques, guided imagery, and mindfulness-based cognitive strategies aimed at improving emotional regulation and coping abilities (Feli et al., 2024). These interventions encourage individuals to become more aware of their thoughts, emotions, and bodily sensations without reacting negatively or excessively to stressful experiences. Through this process, mindfulness may help pregnant women better manage anxiety, stress, and emotional distress during pregnancy and postpartum.

Mindfulness-based interventions have increasingly been adapted specifically for pregnant and postpartum women. Various mindfulness programs have been developed, including Mindfulness-Based Childbirth and Parenting (MBCP), mindfulness-based counseling, meditation and relaxation programs, smartphone-based mindfulness training, and electronic mindfulness-based interventions (eMBIs) (Oskoui et al., 2023). These interventions may be delivered through face-to-face counseling sessions, group training, online platforms, or mobile applications. The development of digital mindfulness interventions has become particularly important because smartphone and internet-based programs may increase accessibility, flexibility, and cost-effectiveness of mental health services for pregnant women (Hassdenteufel et al., 2023).

Several randomized controlled trials have demonstrated the beneficial effects of mindfulness-based interventions on maternal mental health outcomes. Previous studies reported that mindfulness interventions significantly reduced anxiety, depressive symptoms, stress, fear of childbirth, and pregnancy-related distress among pregnant women (Oskoui et al., 2023). Other studies

also found improvements in emotional well-being, mindfulness awareness, childbirth satisfaction, parenting confidence, maternal–fetal attachment, and breastfeeding self-efficacy following mindfulness interventions. Furthermore, continued mindfulness practice during the postpartum period was associated with sustained improvements in stress reduction and positive emotional states. These findings suggest that mindfulness-based interventions may provide comprehensive psychological benefits for women during the perinatal period (Feli et al., 2024).

In addition to improving maternal psychological outcomes, mindfulness-based interventions may also positively influence childbirth experiences and postpartum adjustment. Studies showed that women receiving mindfulness-based counseling reported lower labor pain intensity, reduced childbirth fear, higher childbirth satisfaction, and more positive childbirth experiences compared with women receiving routine prenatal care alone (Oskoui et al., 2023). Mindfulness interventions have also been associated with improved emotional regulation, reduced parenting stress, and enhanced bonding between mothers and infants during the postpartum period. These outcomes indicate that mindfulness-based interventions may contribute not only to maternal mental health but also to the overall quality of maternal adaptation during pregnancy and early motherhood.

Although previous studies have explored mindfulness-based interventions during pregnancy and postpartum, the available evidence remains fragmented regarding the effectiveness of different intervention types, delivery methods, and psychological outcomes. In particular, recent developments in digital mindfulness interventions and blended care approaches have introduced new forms of maternal mental health support that require further evaluation. Inconsistencies across studies concerning anxiety reduction, depressive symptoms, stress management, and childbirth-related outcomes also indicate the need for a more comprehensive synthesis of recent evidence (Hulsbosch et al., 2023). Therefore, an updated systematic review is needed to better understand the effectiveness of mindfulness-based interventions for improving perinatal maternal mental health. Based on these considerations, this systematic literature review aims to analyze and summarize the effectiveness of mindfulness-based interventions for perinatal maternal mental health.

RESEARCH METHODS

This study employed a systematic literature review design using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) approach to systematically identify, screen, and select relevant studies regarding mindfulness-based interventions for perinatal maternal mental health. The review aimed to analyze recent evidence related to the effectiveness of mindfulness-based interventions in improving maternal mental health outcomes during pregnancy and the postpartum period. The literature search was conducted between January and March 2026 using four electronic databases, namely Google Scholar, ScienceDirect, PubMed, and SpringerLink. The keywords used in the search process included “mindfulness-based intervention,” “mindfulness,” “maternal mental health,” “perinatal mental health,” “pregnancy,” “postpartum,” “anxiety,” “stress,” and “depression.” Boolean operators such as

AND and OR were applied to optimize the search strategy. The search focused on articles published between 2021 and 2026.

The initial search identified 6,095 articles consisting of 5,780 articles from Google Scholar, 180 from ScienceDirect, 90 from PubMed, and 45 from SpringerLink. After duplicate removal, 5,842 articles remained for title and abstract screening. Articles unrelated to mindfulness-based interventions, maternal mental health, or the perinatal population were excluded during the screening stage, resulting in 132 articles eligible for full-text review.

The inclusion criteria were: (1) original research articles published between 2021 and 2026; (2) articles written in English; (3) studies involving pregnant women or postpartum mothers; (4) studies examining mindfulness-based interventions; and (5) studies evaluating maternal mental health outcomes such as anxiety, depression, stress, fear of childbirth, emotional well-being, or childbirth satisfaction. Meanwhile, exclusion criteria included review articles, conference abstracts, editorials, non-perinatal studies, inaccessible full texts, and studies unrelated to mindfulness-based interventions.

Following the full-text eligibility assessment, 119 articles were excluded because they did not meet the inclusion criteria or had irrelevant outcomes. Finally, 13 articles fulfilled all eligibility criteria and were included in this systematic review. The selected studies mainly consisted of randomized controlled trials investigating various mindfulness-based approaches, including mindfulness counseling, mindfulness-based childbirth and parenting programs, meditation, relaxation techniques, smartphone-based mindfulness interventions, and electronic mindfulness-based interventions.

Data extraction was conducted systematically using an extraction table containing information regarding author, publication year, country, study design, sample size, intervention type, outcome variables, and key findings. The extracted data were systematically synthesized and analyzed descriptively to evaluate the effectiveness of mindfulness-based interventions in improving maternal mental health outcomes during the perinatal period.

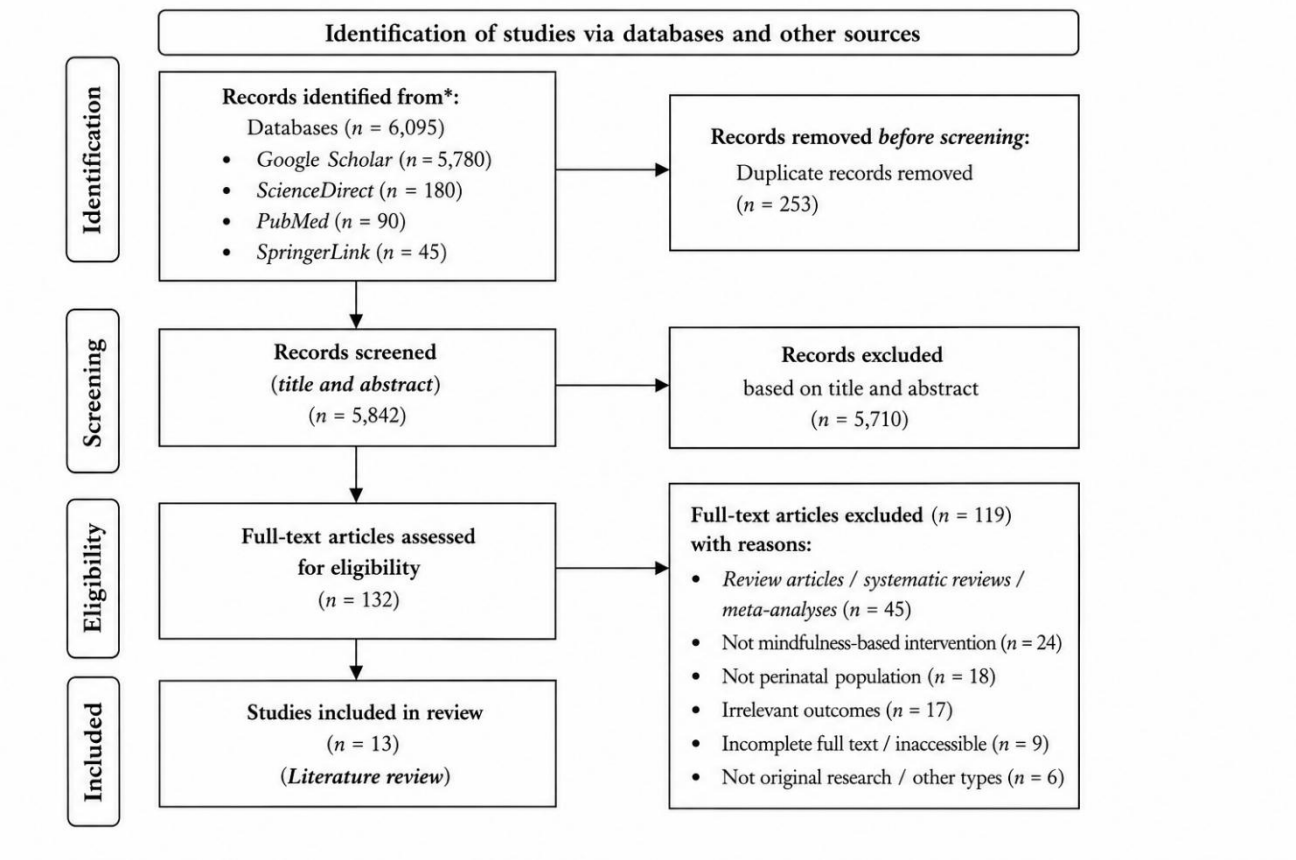

Figure 1. PRISMA Flowchart

RESULT and DISCUSSION

Based on the article selection process using the PRISMA approach, a total of 13 articles met the inclusion criteria and were analyzed in this systematic review. The selected studies were published between 2021 and 2026 and predominantly used randomized controlled trial designs involving pregnant women and postpartum mothers. The reviewed studies investigated various forms of mindfulness-based interventions, including mindfulness-based counseling, mindfulness-based childbirth and parenting programs, meditation and relaxation techniques, smartphone-based mindfulness interventions, mobile mindfulness applications, and electronic mindfulness-based interventions.

Overall, the findings demonstrated that mindfulness-based interventions had positive effects on maternal mental health during the perinatal period. Most studies reported significant reductions in anxiety, depression, stress, fear of childbirth, and pregnancy-related distress among women receiving mindfulness interventions compared with control groups receiving standard prenatal care or routine education. Several studies also showed improvements in emotional well-being, childbirth satisfaction, breastfeeding self-efficacy, maternal–fetal attachment, mindfulness awareness, and parenting outcomes. However, some studies reported that the effectiveness of mindfulness

interventions varied depending on intervention type, duration, participant adherence, and delivery method. The summary of the reviewed studies is presented in Table 1.

Table 1. Characteristics and Main Findings of Included Studies

Authors and Year	Objective	Study Design and Sample	Main Findings
Sun et al. (2021)	To evaluate the effectiveness of smartphone-based mindfulness training on perinatal depression and mental health outcomes among pregnant women.	Randomized Controlled Trial (RCT); 168 pregnant women.	Compared with the control group, pregnant women receiving smartphone-based mindfulness training experienced greater reductions in depressive symptoms and anxiety. The intervention group also showed improvements in positive affect and emotional well-being after the intervention. Nulliparous women demonstrated stronger improvements in depression scores, indicating that mindfulness training may be particularly beneficial for first-time mothers.
Hulsbosch et al. (2023)	To examine the effectiveness of an online mindfulness-based intervention for women experiencing pregnancy distress.	Randomized Controlled Trial; 219 pregnant women.	Both groups showed improvements in pregnancy distress over time; however, no statistically significant differences were found between the intervention and control groups regarding distress reduction. Nevertheless, participants receiving mindfulness intervention demonstrated greater improvements in mindfulness skills, reduced rumination, and increased self-compassion compared with women receiving usual care alone.
Hassdenteufel et al. (2023)	To investigate the effectiveness of an electronic mindfulness-based intervention (eMBI) on maternal mental health during pregnancy.	Multicenter Randomized Controlled Trial; 460 pregnant women.	The mindfulness intervention group experienced significant reductions in pregnancy-related anxiety and lower risk of postpartum mental health problems compared with the control group. Although depressive and general anxiety symptoms did not significantly differ between groups, mindfulness scores improved substantially among participants receiving the intervention.
Wang et al. (2023)	To evaluate the effects of mindfulness-based psychosomatic intervention on depression, anxiety, fear	Randomized Controlled Trial; 104 primiparous women.	Women in the intervention group reported significantly lower levels of anxiety, depression, and fear of childbirth compared with the active control group. In addition, mindfulness

Authors and Year	Objective	Study Design and Sample	Main Findings
	of childbirth, and life satisfaction.		intervention increased life satisfaction and mindfulness awareness from pregnancy until the postpartum period. The positive psychological outcomes were more consistent among women receiving mindfulness intervention than those receiving routine prenatal education.
Oskoui et al. (2023)	To determine the effect of mindfulness-based counseling on childbirth experience and labor pain.	Randomized Controlled Clinical Trial; 64 primiparous women.	Compared with the control group, women receiving mindfulness-based counseling reported significantly better childbirth experiences and lower labor pain intensity during childbirth. The intervention group demonstrated higher emotional preparedness and more positive perceptions of labor and delivery.
Feli et al. (2024)	To evaluate the effect of mindfulness-based counseling on anxiety and childbirth satisfaction among primiparous women.	Randomized Controlled Trial; 60 pregnant women.	Anxiety scores significantly decreased in the mindfulness intervention group immediately after the intervention and one month later compared with the control group. Furthermore, mothers receiving mindfulness counseling reported higher childbirth satisfaction scores after delivery than women receiving routine prenatal care alone.
Park et al. (2025)	To evaluate the effectiveness of a mobile mindfulness intervention on anxiety, depression, stress, and emotional well-being.	Randomized Controlled Trial; 133 pregnant women.	Pregnant women receiving the mobile mindfulness program experienced greater reductions in anxiety and improvements in emotional well-being compared with the wait-list control group. The intervention also improved maternal–fetal attachment and mindfulness awareness, although changes in depression and stress were not significantly different between groups.
Hassdenteufel et al. (2023)	To investigate the effectiveness of a blended mindfulness care approach on maternal mental health and gestational weight control.	Randomized Controlled Trial; 460 pregnant women.	Women receiving blended mindfulness care combined with personal coaching sessions demonstrated lower depression and anxiety scores compared with participants receiving minimal coaching or standard care. The intervention group also showed better mindfulness outcomes and healthier gestational weight control, indicating that combining digital

Authors and Year	Objective	Study Design and Sample	Main Findings
			intervention with direct support enhanced effectiveness.
Laurent et al. (2025)	To examine the relational effects of mindfulness-based childbirth and parenting interventions.	Randomized Controlled Trial; pregnant women with elevated anxiety symptoms.	Compared with community birthing classes, mindfulness-based childbirth and parenting interventions showed greater benefits in reducing parenting stress and improving compassion and bonding outcomes among mothers with higher intervention adherence. Participants who practiced mindfulness more consistently demonstrated stronger relational and emotional improvements.
Zhu et al. (2025)	To evaluate the effects of meditation and prenatal education on fear and confidence in vaginal delivery.	Retrospective Cohort Study; 212 pregnant women.	Women receiving meditation and prenatal education experienced lower fear of childbirth, lower anxiety levels, and greater childbirth confidence than women receiving standard prenatal care. Postpartum comfort and labor adaptation scores were also significantly higher in the intervention group.
Farzaei et al. (2026)	To assess the effects of mindfulness-based intervention on maternal stress reduction and breastfeeding self-efficacy.	Randomized Controlled Trial; 66 nulliparous pregnant women.	Compared with the control group, women receiving mindfulness intervention showed significantly greater improvements in breastfeeding self-efficacy, breastfeeding adequacy, and breastfeeding performance after childbirth. The intervention group also demonstrated better infant growth indicators, including weight and head circumference.
Babiy et al. (2026)	To evaluate the effectiveness of mindfulness intervention for postpartum anxiety disorders.	Randomized Controlled Trial Protocol; 50 postpartum mothers.	The study proposed that mindfulness intervention combined with usual treatment would improve anxiety symptoms, emotional regulation, and interoceptive awareness among postpartum mothers compared with treatment as usual alone. The protocol also highlighted the potential neural and psychological benefits of mindfulness intervention during the postpartum period.
Lönnberg et al. (2021)	To investigate the long-term effects of mindfulness-based childbirth and parenting	Randomized Controlled Trial; 193 pregnant women.	Women participating in mindfulness-based childbirth and parenting programs showed greater reductions in stress and depressive symptoms

Authors and Year	Objective	Study Design and Sample	Main Findings
	programs during pregnancy.		compared with the control group immediately after the intervention. However, long-term benefits were more evident among mothers who continued practicing mindfulness postpartum, suggesting that intervention sustainability influenced psychological outcomes.

The Effect of Mindfulness-Based Interventions on Anxiety

Differences in intervention duration, intensity, and delivery methods emerged as important factors contributing to variations in anxiety outcomes across the reviewed studies. Although most studies reported favorable effects of mindfulness-based interventions, the magnitude of improvement was not uniform. A comparative analysis revealed that interventions delivered through structured face-to-face counseling or group-based sessions generally demonstrated more robust and consistent anxiety reductions than fully self-guided digital programs. For example, Wang et al. (2023) and Feli et al. (2024) reported significant reductions in anxiety among pregnant women receiving mindfulness-based counseling and psychosomatic mindfulness training, respectively. Similarly, Oskoui et al. (2023) found that mindfulness-based counseling improved childbirth experiences while simultaneously reducing labor-related distress. These findings suggest that direct interaction with trained facilitators may strengthen intervention effectiveness by providing emotional support, opportunities for reflection, and immediate clarification of mindfulness practices.

In contrast, findings from digital mindfulness interventions were more heterogeneous. Hulsbosch et al. (2023) evaluated a self-guided online mindfulness program among pregnant women experiencing pregnancy distress and found improvements in distress levels over time; however, the intervention did not demonstrate significant superiority over usual care. The authors attributed this finding partly to low adherence and limited participant engagement. Likewise, Hassdenteufel et al. (2025) reported that an electronic mindfulness-based intervention reduced pregnancy-related and birth-related anxiety but did not significantly improve general anxiety symptoms. These inconsistencies indicate that accessibility alone may not guarantee intervention effectiveness. While digital platforms increase reach and reduce barriers to participation, they may also be associated with reduced accountability, lower completion rates, and less individualized support. Consequently, participants may engage less deeply with mindfulness practices, thereby limiting therapeutic gains.

A notable pattern identified across studies was the superior performance of blended-care models that combined digital mindfulness training with professional guidance. Hassdenteufel et al. (2025) demonstrated that pregnant women who received additional face-to-face coaching sessions alongside electronic mindfulness training experienced greater reductions in anxiety and depressive symptoms than those receiving digital intervention alone. This

finding highlights the potential importance of therapeutic alliance in mindfulness-based interventions. Human interaction may facilitate motivation, reinforce regular practice, and help participants integrate mindfulness skills into real-life pregnancy-related challenges. Therefore, the effectiveness of mindfulness interventions appears to depend not only on intervention content but also on the degree of interpersonal support accompanying the intervention. This observation may explain why studies employing similar mindfulness frameworks produced different outcomes.

Another explanation for the observed heterogeneity relates to participant adherence and mindfulness practice dosage. Several studies suggested that women who practiced mindfulness more consistently achieved greater psychological benefits than those with lower engagement. Long-term follow-up data from Lönnberg et al. (2021) demonstrated that participants who continued mindfulness practice after the intervention maintained greater improvements in stress and depressive symptoms than those who discontinued practice. Similarly, Laurent et al. (2025) reported that intervention benefits were stronger among participants who engaged more extensively in mindfulness exercises during and after the intervention period. These findings support the theoretical foundation of mindfulness, which emphasizes repeated practice as a mechanism for strengthening attentional control, emotional regulation, and cognitive flexibility. Consequently, differences in adherence rates may substantially influence intervention outcomes and contribute to variations observed across studies.

Beyond statistical significance, the available evidence also suggests that mindfulness-based interventions provide clinically meaningful benefits. Although effect size reporting was inconsistent across studies, the studies that reported effect estimates generally demonstrated small-to-moderate intervention effects. Sun et al. (2021) reported a moderate effect size for anxiety reduction in late pregnancy (Cohen's $d = 0.46$), indicating that the observed improvement was not only statistically significant but also clinically relevant. Furthermore, the intervention reduced the risk of clinically significant depressive symptoms and produced sustained improvements in psychological well-being. Likewise, Hassdenteufel et al. (2025) reported significant reductions in anxiety symptoms with small-to-moderate effect estimates ($\eta^2 = 0.018$), accompanied by improvements in mindfulness scores and emotional outcomes. Although these effect sizes may not be considered large, they remain important from a public health perspective because anxiety during pregnancy is associated with adverse maternal and neonatal outcomes, including fear of childbirth, increased obstetric complications, postpartum psychological disorders, and impaired maternal-infant bonding.

Taken together, the findings indicate that mindfulness-based interventions consistently contribute to anxiety reduction during pregnancy and the postpartum period, although the magnitude of benefit varies according to intervention format, intensity, participant adherence, and baseline psychological risk. The strongest evidence appears to support interventions that combine structured mindfulness training with ongoing professional support, suggesting that future maternal mental health programs may achieve greater effectiveness by integrating digital accessibility with personalized guidance. Such an approach may maximize

both scalability and clinical impact while addressing the diverse psychological needs of pregnant and postpartum women.

The Effect of Mindfulness-Based Interventions on Depression and Stress

This review demonstrated that mindfulness-based interventions also had positive effects on depressive symptoms and stress reduction during the perinatal period. Depression and stress during pregnancy are associated with poor maternal functioning, impaired maternal–infant bonding, breastfeeding difficulties, and increased risk of postpartum mental health disorders. Several reviewed studies consistently demonstrated that mindfulness interventions significantly improved emotional well-being and reduced depressive symptoms compared with standard prenatal care.

The strength of evidence regarding depression reduction was moderate to strong because most included studies used randomized controlled trial designs. Smartphone-based mindfulness training, mindfulness-based childbirth programs, and electronic mindfulness interventions demonstrated favorable outcomes for depressive symptom reduction. However, some studies found limited or non-significant differences between intervention and control groups regarding depression outcomes. This inconsistency may be related to differences in baseline mental health severity, intervention duration, follow-up periods, and participant adherence.

Studies involving intensive mindfulness practice and longer intervention periods tended to report more favorable outcomes. Lönnberg et al. (2021) found that women who continued mindfulness practice postpartum demonstrated more sustained reductions in stress and depressive symptoms compared with women who discontinued practice after childbirth. Similarly, interventions combining digital mindfulness training with direct counseling support produced stronger psychological improvements than self-guided interventions alone. These findings suggest that long-term practice and therapeutic support may enhance the sustainability of mindfulness-related benefits.

Another factor contributing to heterogeneity was the measurement instruments used to assess depression and stress outcomes. Several studies used the Edinburgh Postnatal Depression Scale (EPDS), while others applied different psychological scales such as the State-Trait Anxiety Inventory or Pregnancy Distress Scales. Variations in instrument sensitivity and psychological domains measured may partially explain inconsistencies across studies. Nevertheless, despite methodological differences, most studies consistently demonstrated beneficial effects of mindfulness interventions on maternal psychological well-being.

The Effect of Mindfulness-Based Interventions on Fear of Childbirth and Childbirth Experience

Fear of childbirth emerged as another important outcome influenced by mindfulness-based interventions. Fear of childbirth may negatively affect labor adaptation, increase labor pain perception, and contribute to preference for cesarean delivery. Most reviewed studies demonstrated that mindfulness interventions reduced childbirth fear and improved childbirth experiences among pregnant women, particularly primigravida mothers.

The findings were relatively consistent across studies involving mindfulness-based

counseling, meditation, relaxation techniques, and childbirth education programs. Oskoui et al. (2023) and Zhu et al. (2025) both reported lower fear of childbirth and improved childbirth confidence among women receiving mindfulness interventions compared with control groups. These findings indicate that mindfulness practices may help women reinterpret labor-related pain and stress more adaptively, thereby improving psychological preparedness for childbirth.

However, variations in intervention techniques may explain differences in outcome magnitude across studies. Some interventions emphasized meditation and breathing exercises, while others incorporated body awareness, guided imagery, relaxation methods, or childbirth education components. Interventions combining mindfulness practice with prenatal education appeared to produce broader improvements in childbirth confidence and postpartum adaptation than mindfulness interventions alone. Additionally, studies involving repeated sessions during late pregnancy demonstrated greater effects on childbirth preparation compared with shorter interventions.

Differences in clinical settings may also contribute to heterogeneity. Some studies were conducted in tertiary hospitals with structured maternal care systems, whereas others involved community-based prenatal programs. Women receiving interventions in supportive clinical environments may experience additional emotional reassurance beyond the intervention itself. Therefore, environmental and healthcare support factors should also be considered when interpreting childbirth-related outcomes.

The Effect of Mindfulness-Based Interventions on Emotional Well-Being and Maternal Adaptation

Several reviewed studies demonstrated that mindfulness-based interventions improved emotional well-being, mindfulness awareness, life satisfaction, parenting stress, and maternal adaptation during pregnancy and postpartum. These findings suggest that mindfulness interventions may provide broader psychological benefits beyond symptom reduction alone.

Compared with standard prenatal care, mindfulness-based interventions consistently improved emotional regulation and coping abilities. Wang et al. (2023) reported increased life satisfaction and mindfulness awareness following mindfulness-based psychosomatic interventions, while Laurent et al. (2025) identified improvements in compassion, bonding outcomes, and parenting stress among participants with higher mindfulness adherence. These findings suggest that mindfulness interventions may strengthen maternal emotional resilience during the transition to motherhood.

Nevertheless, heterogeneity remained apparent regarding relational and adaptation outcomes. Studies involving consistent mindfulness practice and higher participant adherence generally reported stronger emotional benefits than studies with low intervention adherence. Furthermore, interventions specifically tailored to childbirth and parenting contexts appeared more effective in improving maternal adaptation than generalized mindfulness interventions. This indicates that intervention specificity and participant engagement may substantially influence psychological outcomes.

The quality of evidence for emotional well-being outcomes was generally moderate because most studies relied on self-reported psychological questionnaires. Although validated instruments were commonly used, self-report measures remain vulnerable to response bias and subjective interpretation. Therefore, future studies incorporating objective behavioral or physiological indicators may strengthen evidence regarding emotional adaptation outcomes.

The Effect of Mindfulness-Based Interventions on Breastfeeding and Parenting Outcomes

This review demonstrated that mindfulness-based interventions may generate benefits extending beyond maternal psychological health, including breastfeeding and parenting-related outcomes. However, a comparison across the reviewed studies indicates that the evidence supporting parenting and breastfeeding outcomes remains less extensive than the evidence supporting reductions in anxiety, depression, and stress. Most randomized controlled trials primarily evaluated maternal psychological symptoms as their main outcomes, whereas breastfeeding performance, parenting stress, maternal-infant bonding, and caregiving-related outcomes were assessed less frequently. Consequently, psychological outcomes represent the most consistently documented benefit of mindfulness interventions during the perinatal period.

The difference in evidence strength between these outcome domains may reflect the underlying mechanism through which mindfulness exerts its effects. Across the reviewed studies, improvements in anxiety, stress, fear of childbirth, emotional well-being, and mindfulness skills were observed repeatedly in diverse populations and intervention formats. In contrast, positive parenting and breastfeeding outcomes tended to emerge in studies where maternal psychological improvements were also evident. This pattern suggests that mindfulness may influence parenting-related outcomes indirectly through improvements in maternal emotional functioning. In other words, reductions in psychological distress may serve as an intermediate pathway linking mindfulness practice with improved maternal caregiving behaviors.

This explanation is supported by findings from Farzaei et al. (2026), who reported significantly higher breastfeeding self-efficacy, breastfeeding adequacy, and breastfeeding performance among women receiving mindfulness-based interventions compared with controls. The intervention group also demonstrated better infant growth indicators. While these findings indicate potential benefits for breastfeeding outcomes, the intervention was simultaneously associated with reduced maternal stress, making it difficult to determine whether breastfeeding improvements resulted directly from mindfulness practice or indirectly from enhanced psychological well-being. Given that maternal stress is known to negatively affect breastfeeding confidence, milk production perceptions, and breastfeeding persistence, reductions in stress may have increased mothers' confidence and capacity to successfully initiate and maintain breastfeeding.

A similar pattern can be observed in parenting-related outcomes. Laurent et al. (2025) found that mindfulness-based childbirth and parenting interventions contributed to lower parenting stress and improved relational functioning, particularly among participants with higher engagement in mindfulness practice and lower baseline

sociodemographic risk. Importantly, the strongest benefits were observed among mothers who actively practiced mindfulness, suggesting that the intervention may enhance parenting through improved emotional awareness, self-regulation, and responsiveness rather than through parenting skills training alone. These findings are consistent with theoretical models proposing that mindfulness strengthens attentional control and emotional regulation, which subsequently improve interpersonal interactions and parent-infant relationships.

Furthermore, the reviewed literature suggests that emotional regulation may represent a key mechanism connecting psychological and parenting outcomes. Anxiety and stress during pregnancy and the postpartum period can reduce maternal responsiveness, impair confidence in infant care, and interfere with adaptive coping during breastfeeding and early parenting challenges. Mindfulness interventions encourage non-judgmental awareness of thoughts and emotions, allowing mothers to respond more adaptively to stressful situations. As emotional regulation improves, mothers may become more capable of managing infant-related demands, maintaining breastfeeding practices, and developing positive interactions with their infants. Therefore, parenting and breastfeeding benefits may not constitute independent effects of mindfulness but rather downstream consequences of broader improvements in maternal psychological functioning.

Despite these promising findings, caution is warranted when interpreting the available evidence. Compared with anxiety and depression outcomes, parenting and breastfeeding outcomes were investigated in fewer studies and measured using diverse instruments, limiting comparability across studies. In addition, most studies were not specifically designed to test mediation pathways between mindfulness, psychological well-being, and parenting outcomes. As a result, current evidence is insufficient to determine whether breastfeeding and parenting improvements are direct effects of mindfulness practice or indirect effects mediated by reductions in stress, anxiety, and emotional dysregulation. Future research should incorporate mediation analyses and longitudinal designs to better clarify these relationships and identify the mechanisms through which mindfulness-based interventions contribute to maternal and infant well-being.

Digital and Mobile Mindfulness-Based Interventions

Digital mindfulness interventions generally demonstrated favorable outcomes regarding anxiety reduction, emotional well-being, mindfulness awareness, and pregnancy-related distress. Their primary advantages include greater accessibility, lower implementation costs, and increased flexibility, making psychological support available to women who may face geographical, financial, or time-related barriers to accessing conventional face-to-face services. These characteristics are particularly relevant during pregnancy and the postpartum period, when frequent healthcare visits and caregiving responsibilities may limit participation in traditional psychological interventions.

Despite these advantages, several challenges were identified across the reviewed studies. Higher dropout rates and lower adherence were consistently observed in self-guided digital interventions compared with supervised or blended programs. Hulsbosch et al. (2023) evaluated a fully

online self-guided mindfulness intervention among pregnant women experiencing pregnancy distress and found improvements in mindfulness-related outcomes; however, the intervention did not demonstrate significant superiority over usual care, with low adherence identified as an important limitation. Similarly, smartphone-based interventions evaluated by Sun et al. (2021) and Park et al. (2025) demonstrated beneficial effects on maternal mental health outcomes, yet participant attrition and incomplete engagement remained notable challenges. These findings suggest that maintaining sustained engagement may be as important as the intervention content itself in determining intervention effectiveness.

One possible explanation for these findings is variation in digital literacy among participants. Effective participation in digital mindfulness programs requires not only access to smartphones or internet services but also the ability to navigate digital platforms, understand online instructions, independently manage learning activities, and maintain regular practice without direct supervision. Although digital literacy was not directly assessed in the reviewed studies, differences in users' ability to interact with digital health technologies may partially explain variations in adherence and intervention outcomes. This issue may be particularly relevant in perinatal populations, where educational background, socioeconomic status, age, and previous experience with digital technologies vary considerably. Participants with lower digital competence may encounter difficulties accessing intervention content, completing program modules, or integrating mindfulness exercises into their daily routines, potentially reducing the effectiveness of otherwise evidence-based interventions.

Comparative findings further indicated that blended interventions combining digital mindfulness programs with direct coaching or counseling sessions produced stronger psychological improvements than purely self-guided interventions. Hassdenteufel et al. (2025) reported that participants who received additional face-to-face coaching sessions alongside electronic mindfulness training experienced greater reductions in anxiety and depressive symptoms than those receiving digital intervention alone. These findings suggest that interpersonal support may enhance engagement by providing guidance, clarification, motivation, and accountability throughout the intervention process. Such support may also help overcome barriers associated with limited digital literacy and improve participants' ability to use digital resources effectively. Therefore, future maternal mental health programs should consider integrating digital accessibility with professional support, user-friendly platform design, and digital orientation strategies to maximize engagement and ensure equitable intervention benefits across populations with varying levels of digital competence.

Overall Synthesis of Findings

Overall, the findings of this systematic review indicate that mindfulness-based interventions demonstrate considerable potential for improving maternal mental health during the perinatal period. The strongest and most consistent evidence was observed for anxiety reduction, stress reduction, fear of childbirth management, and emotional well-being improvement. Evidence regarding depression reduction, parenting outcomes, and breastfeeding outcomes was also generally positive, although some inconsistencies remained across studies.

The overall strength of evidence in this review was strengthened by the

predominance of randomized controlled trials among included studies. Nevertheless, heterogeneity across intervention types, durations, participant characteristics, outcome measures, and clinical settings contributed to variations in findings. Interventions with longer duration, stronger participant adherence, repeated mindfulness practice, and blended therapeutic support generally produced more favorable outcomes.

These findings suggest that mindfulness-based interventions should not be viewed as uniform interventions with identical effects across all populations and settings. Rather, intervention effectiveness appears influenced by multiple contextual and methodological factors. Therefore, future studies should aim to standardize intervention protocols, improve adherence monitoring, and conduct long-term follow-up evaluations to strengthen evidence regarding mindfulness-based interventions for perinatal maternal mental health.

CONCLUSION

Based on the findings of this systematic review, mindfulness-based interventions demonstrated positive effects on maternal mental health during the perinatal period. Most reviewed studies consistently reported reductions in anxiety, stress, depression, pregnancy-related distress, and fear of childbirth among pregnant and postpartum women receiving mindfulness interventions. In addition, mindfulness-based interventions also contributed to improvements in emotional well-being, childbirth satisfaction, mindfulness awareness, maternal–fetal attachment, breastfeeding self-efficacy, and parenting-related outcomes. Various intervention approaches, including mindfulness-based counseling, mindfulness-based childbirth and parenting programs, meditation, relaxation techniques, smartphone-based mindfulness training, and electronic mindfulness-based interventions, were found to provide beneficial psychological outcomes. Overall, the findings suggest that mindfulness-based interventions may serve as effective, safe, and non-pharmacological approaches to support maternal mental health during pregnancy and postpartum.

However, several limitations were identified in this review. The included studies showed substantial heterogeneity regarding intervention types, duration, delivery methods, sample characteristics, outcome measurements, and follow-up periods, which may affect comparability across studies. Some studies also demonstrated inconsistent findings regarding depressive symptom reduction and long-term intervention effectiveness. In addition, most studies relied on self-reported psychological instruments and short-term outcome assessments, potentially increasing the risk of response bias and limiting evaluation of long-term psychological effects. Therefore, future studies are recommended to conduct larger randomized controlled trials using standardized intervention protocols, longer follow-up durations, and more comprehensive outcome measurements. Further research is also needed to explore the effectiveness of mindfulness-based interventions among different maternal populations, including primigravida and multigravida women, as well as to evaluate the integration of digital mindfulness interventions into routine maternal healthcare services.

ACKNOWLEDMENT

The authors would like to express their sincere gratitude to Mrs. Bdn. Ni Wayan Armini, S.ST., M.Keb. and Mrs. Bdn. Ni

Made Dwi Purnamayanti, S.Si.T., M. Keb. for the guidance, support, and valuable contributions during the preparation of this manuscript. The authors also extend their appreciation to Department of Midwifery, Poltekkes Kemenkes Denpasar for providing academic support and facilities throughout the completion of this study. In addition, sincere thanks are addressed to all individuals and parties who directly and indirectly contributed to the writing and completion of this article.

REFERENCE

Amarin, Z. O., Tsikouras, P., Nikolettos, N., Rath, W., & Tempelhoff, G.-F. Von. (2025). *Postpartum Period for Mother and Newborn*. BoD – Books on Demand.

Babiy, Z., Frey, B. N., McCabe, R. E., Bieling, P. J., Minuzzi, L., Puccinelli, C., & Green, S. M. (2026). Mindfulness-Based Intervention for Treatment of Anxiety Disorders During the Postpartum Period: A 4-Week Proof-of-Concept Randomized Controlled Trial Protocol. *Brain Sciences*, *16*(1), 88. https://doi.org/10.3390/brainsci16010088

Dubey, P., Dwivedi, A. K., Sharma, K., Martin, S. L., Thompson, P. M., & Reddy, S. Y. (2025). Associations of mental disorders with maternal health outcomes. *Communications Medicine*, *5*(1), 1–8. https://doi.org/10.1038/s43856-025-01062-8

Ernst, K., Dasilva, G., Srivastav, M., Campson, A., Soto, P., Puvvala, A., Knopf, E., Lobaina, D., Okwaraji, G., Mendonca, J., Frishman, M. B., Knecht, M. K., & Sacca, L. (2025). Challenges in Accessing Mental Health Services in Underserved Pregnant and Postpartum Women: A Scoping Review. *Women*, *5*(3), 31. https://doi.org/10.3390/women5030031

Farzaei, N., Hajian, S., Saatchi, K., & Khabazkhoob, M. (2026). The effects of mindfulness-based interventions on mothers' stress reduction and breastfeeding self-efficacy: A randomized controlled trial. *Journal of Education and Health Promotion*, *15*, 1–10. https://doi.org/10.4103/jehp.jehp

Feli, R., Heydarpour, S., Yazdanbakhsh, K., & Heydarpour, F. (2024). The effect of mindfulness-based counselling on the anxiety levels and childbirth satisfaction among primiparous pregnant women: a randomized controlled trial. *BMC Psychiatry*, *24*(1). https://doi.org/10.1186/s12888-024-06442-3

Hassdenteufel, K., Müller, M., Abele, H., Brucker, S. Y., Graf, J., Zipfel, S., Bauer, A., Jakubowski, P., Pauluschke-Fröhlich, J., Wallwiener, M., & Wallwiener, S. (2023). Using an Electronic Mindfulness-based Intervention (eMBI) to improve maternal mental health during pregnancy: Results from a randomized controlled trial. *Psychiatry Research*, *330*(March). https://doi.org/10.1016/j.psychres.2023.115599

Hassdenteufel, K., Müller, M., Abele, H., Brucker, S. Y., Graf, J., Zipfel, S., Bauer, A., Jakubowski, P., Pauluschke-Fröhlich, J., Wallwiener, M., & Wallwiener, S. (2025). Improving Maternal Mental Health and Weight Control With a Mindfulness Blended Care Approach: Insights From a Randomized Controlled Trial. *Journal*

of Medical Internet Research, *27*, 1–21. https://doi.org/10.2196/56230

Hulsbosch, L. P., Potharst, E. S., Schwabe, I., Boekhorst, M. G. B. M., Pop, V. J. M., & Nyklíček, I. (2023). Online mindfulness-based intervention for women with pregnancy distress: A randomized controlled trial. *Journal of Affective Disorders*, *332*(March), 262–272. https://doi.org/10.1016/j.jad.2023.04.009

Laurent, H. K., Haigler, K. L., Sbrilli, M. D., Suzuki, K., & Duncan, L. G. (2025). The relational dimension in mindfulness intervention effects: results of a randomized controlled trial of mindfulness-based childbirth and parenting. *BMC Pregnancy and Childbirth*, *25*(1). https://doi.org/10.1186/s12884-025-07676-z

Lönnberg, G., Jonas, W., Bränström, R., Nissen, E., & Niemi, M. (2021). Long-term Effects of a Mindfulness-Based Childbirth and Parenting Program—a Randomized Controlled Trial. *Mindfulness*, *12*(2), 476–488. https://doi.org/10.1007/s12671-020-01403-9

Oskoui, B. S., Mehrabi, E., Nourizadeh, R., & Esmaeilpour, K. (2023). The effect of mindfulness-based counseling on the childbirth experience of primiparous women: a randomized controlled clinical trial. *BMC Pregnancy and Childbirth*, *23*(1), 1–9. https://doi.org/10.1186/s12884-023-05607-4

Pan, T., Zeng, Y., Chai, X., Wen, Z., Tan, X., & Sun, M. (2024). Global Prevalence of Perinatal Depression and Its Determinants Among Rural Women: A Systematic Review and Meta-Analysis. *Depression and Anxiety*, *2024*. https://doi.org/10.1155/2024/1882604

Park, S., Cho, H. Y., Park, J. Y., Chung, K., & Jhung, K. (2025). Development and Evaluation of a Mindfulness-Based Mobile Intervention for Perinatal Mental Health: Randomized Controlled Trial. *Journal of Medical Internet Research*, *27*. https://doi.org/10.2196/56601

Răchită, A. I. C., Strete, G. E., Sălcudean, A., Ghiga, D. V., Rădulescu, F., Călinescu, M., Nan, A. G., Sasu, A. B., Suciu, L. M., & Mărginean, C. (2023). Prevalence and Risk Factors of Depression and Anxiety among Women in the Last Trimester of Pregnancy: A Cross-Sectional Study. *Medicina (Lithuania)*, *59*(6). https://doi.org/10.3390/medicina59061009

Sun, Y., Li, Y., Wang, J., Chen, Q., Bazzano, A. N., & Cao, F. (2021). Effectiveness of smartphone-based mindfulness training on maternal perinatal depression: Randomized controlled trial. *Journal of Medical Internet Research*, *23*(1). https://doi.org/10.2196/23410

Wang, S. L., Sun, M. Y., Huang, X., ZHANG, D. M., YANG, L., XU, T., PAN, X. P., & ZHENG, R. M. (2023). Benefits of Mindfulness Training on the Mental Health of Women During Pregnancy and Early Motherhood: A Randomized Controlled Trial. *Biomedical and Environmental Sciences*, *36*(4), 353–366. https://doi.org/10.3967/bes2023.041

World Health Organization. (2022). *Guide*

for integration of perinatal mental health in maternal and child health services. WHO.

Zhu, J., Zhou, M., Wang, T., Ma, X., & Yong, D. (2025). Effect of meditation and prenatal education on fear and confidence in vaginal delivery. *Frontiers in Public Health*, *13*(December), 1–10. https://doi.org/10.3389/fpubh.2025.1712740