INDEX COPERNICUS INTERNATIONAL

E-ISSN - 2477-6521
Vol 11 (2) June 2026 (46-63)

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

PRENATAL YOGA AND IMPROVING MATERNAL HEALTH OUTCOMES: A LITERATURE REVIEW

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Submitted: 08-06-2026, Reviewed: 22-06-2026, Accepted: 28-06-2026
DOI: http://doi.org/10.22216/jen.v11i2.3583

ABSTRACT

Pregnancy is a critical period characterized by numerous physical and psychological changes that can affect maternal well-being, including anxiety, fear of childbirth, musculoskeletal discomfort, and reduced quality of life. Prenatal yoga has increasingly been recognized as a complementary non-pharmacological intervention that promotes both physical and psychological well-being among pregnant women. This literature review aimed to analyze the effectiveness of prenatal yoga in optimizing maternal health during pregnancy. A narrative literature review was conducted using articles retrieved from Google Scholar, PubMed, and ScienceDirect. The literature search focused on studies published within the last five years using keywords related to prenatal yoga, maternal health, anxiety, mental health, and pregnancy outcomes. A total of 10 studies met the inclusion criteria and were included in the review. The findings consistently demonstrated that prenatal yoga reduced anxiety, fear of childbirth, and psychological distress while improving emotional regulation, mental well-being, and readiness for labor. Several studies also reported positive effects on physical health, including reduced pelvic girdle pain, improved physical function, and favorable changes in physiological parameters related to iron metabolism. In addition, evidence suggested that prenatal yoga may contribute to healthier pregnancy outcomes, including a lower risk of preterm birth and appropriate gestational weight gain. Prenatal yoga represents a safe, accessible, and multidimensional intervention that may support holistic maternal health and enhance the quality of antenatal care.

Keywords/Keywords*: anxiety; prenatal yoga; pregnant women*

INTRODUCTION

Pregnancy is a complex physiological condition characterized by various significant physical and psychological changes experienced by women (Mindarsih & Masruroh, 2026). These changes are influenced by hormonal fluctuations and the progressive growth and development of the fetus, resulting in various discomforts such as back pain, sleep disturbances, fatigue, and emotional instability. This condition demonstrates that pregnancy is not merely a biological process but also a multidimensional experience that requires a

comprehensive healthcare approach encompassing physical, psychological, and social aspects (Nurianto et al., 2023).

Psychological disorders during pregnancy, particularly anxiety, remain a prevalent issue with substantial implications for both maternal and fetal health. The prevalence of anxiety among pregnant women has been reported to range from 12.5% to 42%, with an increasing trend during the third trimester approaching childbirth, reaching approximately 30% (Hilmiy et al., 2024; Nurianto et al., 2023). Poorly managed anxiety may trigger various complications, including preterm birth, low birth weight, impaired fetal development, and an increased likelihood of medical interventions such as cesarean delivery due to excessive fear of childbirth (Fatrida & Tanjung, 2023). Therefore, psychological well-being during pregnancy deserves equal attention alongside physical health within maternal healthcare services.

Pregnant women also experience various physical complaints that may affect their quality of life, one of which is pelvic pain and musculoskeletal discomfort. Pelvic pain during pregnancy has a relatively high prevalence and is associated with hormonal changes, biomechanical adaptations, and postural adjustments resulting from uterine enlargement. This condition not only interferes with daily activities but may also reduce maternal preparedness for childbirth and indirectly increase stress levels (Sukamti et al., 2022). Consequently, interventions capable of addressing physical discomfort while simultaneously providing psychological relaxation are essential.

To address these challenges, interventions are needed that extend beyond medical treatment and incorporate non-pharmacological approaches that are safe, effective, and easily implemented by pregnant women. One increasingly recommended intervention is prenatal yoga, a form of physical activity specifically modified to meet the needs of pregnant women. Prenatal yoga integrates physical postures (asanas), breathing techniques (pranayama), relaxation exercises, and meditation aimed at promoting balance between physical and mental health (Bara et al., 2024). This approach aligns with the concept of holistic midwifery care, which emphasizes harmony between the body and mind.

Numerous studies have demonstrated that prenatal yoga provides significant benefits for maternal health from both physical and psychological perspectives. Psychologically, prenatal yoga has been shown to reduce anxiety levels, improve mental well-being, and help women manage stress during the antenatal period. Furthermore, it contributes to reducing fear of childbirth, thereby enhancing emotional readiness for labor and delivery (Astuti et al., 2023; Fitri et al., 2025). These findings indicate that prenatal yoga serves not only as a preventive intervention but also as a health-promoting strategy to enhance maternal well-being.

From a physical perspective, prenatal yoga has been associated with reductions in pregnancy-related discomforts, including pelvic pain and lower back pain, while also improving flexibility and muscular strength. Additionally, prenatal yoga contributes to improvements in physiological conditions, including hematological parameters related to iron metabolism among pregnant women. Therefore, prenatal yoga may be considered

a multidimensional intervention with substantial benefits for maternal health (Bara et al., 2024; Sukamti et al., 2022).

Prenatal yoga has also been associated with improved pregnancy outcomes, including a reduced risk of adverse pregnancy outcomes such as preterm birth and inappropriate gestational weight gain. As a mind–body-based physical activity, prenatal yoga offers the advantage of simultaneously addressing both physical and psychological dimensions, making it a promising promotive and preventive strategy within maternal healthcare services (Thrower et al., 2026). These findings further support the importance of integrating prenatal yoga into midwifery practice.

Several literature reviews have previously examined the effects of prenatal yoga during pregnancy; however, their scope has generally been limited to specific outcomes. Ningsi & Ainiyah (2025), for example, focused primarily on the effectiveness of yoga in reducing anxiety among pregnant women, concluding that prenatal yoga contributes significantly to improved emotional well-being. Meanwhile, Chen et al. (2025) conducted a systematic review and meta-analysis focusing on birth outcomes, reporting that prenatal yoga was associated with lower rates of cesarean section, preterm birth, and perineal trauma, as well as shorter labor duration. Although these reviews provide valuable evidence regarding the benefits of prenatal yoga, they primarily address isolated aspects of maternal health rather than evaluating its overall impact across multiple health domains.

Despite the growing body of evidence, a comprehensive synthesis integrating the physical, psychological, physiological, and pregnancy-related outcomes of prenatal yoga remains limited. Existing studies have investigated diverse outcomes, including anxiety, fear of childbirth, mental well-being, pelvic pain, iron metabolism, gestational weight gain, and pregnancy outcomes, but these findings remain fragmented across different research areas. Furthermore, variations in study design, participant characteristics, intervention protocols, and outcome measurements contribute to heterogeneity in the available evidence. Therefore, a broader literature review is needed to synthesize current findings and provide a more holistic understanding of the role of prenatal yoga in optimizing maternal health throughout pregnancy.

Based on these considerations, this study aims to comprehensively analyze existing evidence regarding the role of prenatal yoga in optimizing maternal health, particularly in relation to physical health, psychological well-being, and quality of life. Unlike previous reviews that focused on specific outcomes such as anxiety reduction or birth outcomes, this review integrates evidence across multiple dimensions of maternal health to provide a more comprehensive foundation for evidence-based midwifery practice.

RESEARCH METHODS

This study employed a narrative literature review approach to explore the role of prenatal yoga in promoting maternal health. Relevant literature was identified through searches of electronic databases, including Google Scholar, PubMed, and ScienceDirect. The search process utilized keywords related to prenatal yoga and maternal health, including “prenatal yoga,” “pregnant

women," "maternal health," "anxiety," "mental health," and "pregnancy outcomes." The search focused on articles published within the last five years to ensure that the review reflected current evidence and contemporary developments in maternal healthcare.

The reviewed literature primarily consisted of studies examining the effects of prenatal yoga on physical health, psychological well-being, physiological parameters, pregnancy outcomes, and quality of life among pregnant women. Quantitative, quasi-experimental, observational, cohort, and other empirical studies relevant to the topic were considered. Articles that did not address prenatal yoga or maternal health outcomes were not included in the review.

The selected literature was analyzed using a narrative synthesis approach. Information related to study characteristics, participant populations, intervention characteristics, and reported outcomes was reviewed and summarized descriptively. Particular attention was given to identifying common findings, methodological differences, and the practical implications of prenatal yoga for maternal and midwifery care. Due to the diversity of study designs and outcome measures across the reviewed studies, the findings were synthesized narratively rather than through quantitative meta-analysis.

RESULT AND DISCUSSION

Based on a comprehensive review of the available literature, a total of 10 studies met the eligibility criteria and were included in this review. These studies, published in both national and international journals, examined the effects of prenatal yoga on various dimensions of maternal health. The reported outcomes encompassed a broad range of psychological and physiological indicators, including reductions in anxiety levels and fear of childbirth, improvements in mental well-being, alleviation of pelvic pain, and favorable changes in biological markers such as hepcidin and ferritin levels.

The majority of the included studies employed quasi-experimental or pretest–posttest designs and predominantly involved pregnant women in the second and third trimesters of pregnancy. Despite variations in study design, intervention protocols, and outcome measures, the findings consistently demonstrated beneficial effects of prenatal yoga on maternal health. These benefits were attributed to the integration of breathing exercises, relaxation techniques, positive affirmations, and structured physical movements, which collectively contribute to enhanced physical preparedness, emotional regulation, and psychological resilience during pregnancy and childbirth.

Overall, the evidence suggests that prenatal yoga represents a promising complementary intervention for promoting maternal well-being and supporting holistic prenatal care. A detailed summary of the characteristics and findings of the included studies is presented in Table 1.

Table 1. Summary of Included Studies Examining the Effects of Prenatal Yoga on Maternal Health

Title, Author(s), Year	Objective	Study Design and Sample	Key Findings
The Effect of Prenatal Gentle Yoga on Anxiety Levels Among Third-Trimester Pregnant Women at Cahaya 2 Primary Clinic, Lubuk Pakam Nurianto et al. (2023)	To determine the effect of prenatal gentle yoga on anxiety levels among third-trimester pregnant women.	Quasi-experimental one-group pretest–posttest design. A total of 20 third-trimester pregnant women were recruited through purposive sampling.	Prior to the intervention, participants exhibited moderate anxiety with a mean score of 18.75. Following prenatal gentle yoga, the mean anxiety score decreased to 11.75, indicating mild anxiety. Paired t-test analysis revealed a statistically significant reduction in anxiety ($p < 0.001$). The authors suggested that breathing exercises, relaxation techniques, positive thinking, and physical movements contributed to improved emotional regulation and reduced anxiety before childbirth.
The Effect of Yoga Exercise on Anxiety Levels Among Primigravida Women in the Third Trimester of Pregnancy Hilmiy et al. (2024)	To assess the effect of prenatal yoga on anxiety levels among third-trimester primigravida women.	Pre-experimental one-group pretest–posttest design involving 16 third-trimester primigravida women experiencing childbirth-related anxiety. Anxiety was assessed using the Hamilton Anxiety Rating Scale (HARS).	All participants reported anxiety before the intervention. Following prenatal yoga, 43.8% reported no anxiety, 43.8% experienced mild anxiety, and only 12.5% remained moderately anxious. Prenatal yoga effectively reduced anxiety through breathing exercises, relaxation, enhanced flexibility, and improved mental calmness.
Exercise for Pain Relief in Yoga Is Effective in Reducing Pelvic Girdle Pain During the Third	To evaluate the effectiveness of prenatal yoga in reducing pelvic girdle pain among third-	Non-randomized controlled experimental study involving 50 pregnant women with pelvic girdle pain, divided into	The yoga group experienced a significant reduction in pelvic pain compared with the control group. Mean pain scores decreased from 4.36 to 2.08 ($p < 0.001$). The authors

Title, Author(s), Year	Objective	Study Design and Sample	Key Findings
Trimester of Pregnancy Sukamti et al. (2022)	trimester pregnant women.	intervention (n = 25) and control groups (n = 25).	reported that prenatal yoga improved body biomechanics, reduced stress hormones, and enhanced neuroendocrine balance, thereby alleviating physical discomfort during pregnancy.
Prenatal Gentle Yoga Education as a Relaxation Strategy for Pregnant Women Insani et al. (2024)	To improve pregnant women's knowledge regarding prenatal gentle yoga as a relaxation and childbirth preparation strategy.	Community-based health education program involving 22 pregnant women from the first to third trimesters at a primary healthcare center.	Prior to the intervention, most participants had limited knowledge of prenatal yoga benefits. Following educational sessions using presentations and leaflets, participants demonstrated improved understanding of prenatal yoga, appropriate practice timing, and preparation procedures. All participants expressed willingness to engage in prenatal yoga during pregnancy.
Effects of Prenatal Yoga on the Anxiety of Pregnant Women Before Birth Setiyarini et al. (2024)	To investigate the effect of prenatal yoga on maternal anxiety before childbirth.	Quasi-experimental pretest–posttest study involving 12 pregnant women between 14 and 40 weeks of gestation attending prenatal yoga classes. Anxiety was measured using HARS.	Prenatal yoga significantly reduced anxiety levels ($p < 0.001$). The intervention was associated with improved hypothalamic blood flow, parasympathetic nervous system activation, normalization of blood pressure and respiration, and enhanced psychological adaptation to pregnancy.
Differences in Emotional Regulation and Anxiety Among Pregnant Women Based on	To compare anxiety levels and emotional regulation between pregnant women who participated in prenatal yoga and	Comparative ex post facto study involving 74 pregnant women, equally divided between prenatal yoga and non-yoga groups. Emotional regulation and anxiety were	Significant differences in anxiety levels were observed between the two groups ($p = 0.006$), with lower anxiety reported among yoga participants. Women attending prenatal yoga also demonstrated moderate-to-

Title, Author(s), Year	Objective	Study Design and Sample	Key Findings
Participation in Prenatal Yoga Imamah & Surjaningrum (2022)	those who did not.	assessed using the ERQ and PASS instruments.	high emotional regulation. The authors concluded that prenatal yoga contributes to anxiety reduction primarily through improved coping mechanisms and psychological relaxation.
Impact of Attending Prenatal Yoga Classes on Prepartum Maternal Mental Health: A Quasi-Experimental Study Fitri et al. (2025)	To examine the impact of prenatal yoga classes on maternal mental health before childbirth.	Quasi-experimental pretest–posttest study with a control group involving 106 pregnant women. Mental well-being was assessed using the WHO-5 Well-Being Index.	The intervention group demonstrated significantly higher mental well-being scores than the control group (84.04 vs. 67.32; $p < 0.001$). Prenatal yoga improved psychological well-being, reduced anxiety and fear of childbirth, and enhanced maternal adaptation to pregnancy and labor.
Yoga as a Form of Leisure-Time Physical Activity and Pregnancy Health Outcomes Thrower et al. (2026)	To investigate the association between prenatal yoga, adverse pregnancy outcomes, and gestational weight gain.	Prospective cohort study involving 7,502 nulliparous pregnant women in the United States, followed from early pregnancy through childbirth.	Prenatal yoga was associated with a lower risk of adverse pregnancy outcomes, particularly preterm birth. Women with higher yoga participation demonstrated a reduced risk of preterm delivery (RR = 0.42). Yoga was also associated with healthier gestational weight gain patterns.
Effects of Prenatal Yoga Exercise on Hepcidin and Ferritin Levels in Pregnant Women Bara et al. (2024)	To examine the effects of prenatal yoga on hepcidin and ferritin levels among pregnant women.	Quasi-experimental pretest–posttest study with a control group involving 134 second-trimester pregnant women.	Eight weeks of prenatal yoga significantly reduced serum hepcidin levels ($p = 0.002$), particularly among overweight pregnant women. Ferritin levels increased across all groups, although the increase was not statistically significant. The findings suggest that prenatal yoga may support iron

Title, Author(s), Year	Objective	Study Design and Sample	Key Findings
			metabolism and contribute to anemia prevention.
Prenatal Gentle Yoga Helps Pregnant Women Reduce Fear of Childbirth Astuti et al. (2023)	To evaluate the effect of prenatal gentle yoga on fear of childbirth among pregnant women.	Cross-sectional case–control study involving 130 primigravida women in Central Java. Fear of childbirth was measured using the Wijma Delivery Expectancy/Experience Questionnaire.	Women who participated in prenatal gentle yoga for at least eight hours demonstrated significantly lower levels of fear of childbirth than non-participants ($p < 0.001$). Prenatal yoga emerged as the strongest predictor of reduced childbirth fear ($R^2 = 0.26$), primarily through breathing exercises, relaxation techniques, positive affirmations, and posture training.

Effects of Prenatal Yoga on Psychological Outcomes: Anxiety Reduction and Emotional Regulation

One of the most consistent findings identified across the reviewed studies is the positive effect of prenatal yoga on reducing anxiety among pregnant women. Anxiety is one of the most common psychological challenges experienced during pregnancy, particularly during the third trimester when concerns regarding labor, childbirth complications, and maternal responsibilities become increasingly prominent. Four studies included in this review specifically investigated anxiety-related outcomes and consistently reported significant improvements following participation in prenatal yoga programs (Hilmiy et al., 2024; Imamah & Surjaningrum, 2022; Nurianto et al., 2023; Setiyarini et al., 2024).

The consistency of these findings across different populations and study designs strengthens the evidence supporting prenatal yoga as a beneficial non-pharmacological intervention for maternal psychological health.

Evidence from intervention-based studies consistently demonstrates that prenatal yoga is associated with significant reductions in maternal anxiety. Nurianto et al. (2023), Hilmiy et al. (2024), and Setiyarini et al. (2024) all reported improvements in anxiety following prenatal yoga participation despite differences in participant characteristics and intervention protocols. This consistency suggests that the anxiolytic benefits of prenatal yoga may be robust across diverse pregnant populations. However, the magnitude of improvement varied among studies, indicating that participant characteristics and intervention design may influence the extent of psychological benefit achieved.

Differences in study populations appear to be one important source of heterogeneity. Hilmiy et al. (2024) specifically recruited primigravida women, a group generally considered more vulnerable to childbirth-

related anxiety because of limited prior experience with pregnancy and labor. Consequently, greater reductions in anxiety may be expected within this population due to higher baseline anxiety levels. In contrast, Setiyarini et al. (2024) included women across a broader gestational age range, encompassing different psychological challenges and levels of childbirth preparedness. Such variations in baseline characteristics may partially explain differences in the magnitude of anxiety reduction reported across studies.

Methodological differences may also contribute to variability in findings. The reviewed studies employed different durations, frequencies, and formats of prenatal yoga, ranging from prenatal gentle yoga programs to structured prenatal yoga classes. Furthermore, anxiety was assessed using different measurement instruments, which may influence the sensitivity of outcome detection and limit direct comparisons between studies. Nevertheless, despite these methodological differences, all intervention studies reported favorable effects, suggesting that anxiety reduction represents one of the most consistent benefits of prenatal yoga during pregnancy.

Additional insights were provided by Imamah & Surjaningrum (2022), who compared pregnant women participating in prenatal yoga with those who did not engage in yoga activities. Unlike intervention studies that primarily assessed changes in anxiety scores, this study examined emotional regulation as a potential mechanism underlying psychological improvement. Women who participated in prenatal yoga demonstrated both lower anxiety levels and better emotional regulation than non-participants. These findings suggest that prenatal yoga may not only reduce anxiety symptoms directly but also strengthen adaptive coping strategies and emotional self-regulation, which subsequently contribute to improved psychological well-being during pregnancy.

The consistency of anxiety reduction observed across studies may be explained by the multidimensional nature of prenatal yoga. Unlike conventional physical exercise programs, prenatal yoga integrates breathing exercises, relaxation techniques, mindfulness practices, meditation, and gentle physical movements. These components work synergistically to influence both physiological and psychological pathways associated with stress responses. Breathing exercises encourage autonomic nervous system regulation, promoting parasympathetic activity and reducing physiological arousal. Simultaneously, mindfulness-based practices may help pregnant women focus on present-moment experiences rather than anticipating potential complications or negative childbirth outcomes. This combination of physiological relaxation and cognitive reframing may explain the substantial reductions in anxiety observed across multiple studies.

Another important aspect emerging from the reviewed literature is the role of prenatal yoga in enhancing maternal self-awareness and perceived control. Pregnancy is often accompanied by uncertainty regarding fetal health, labor pain, and maternal competence. Prenatal yoga encourages women to develop greater awareness of bodily sensations and emotional responses, fostering confidence in their ability to cope with pregnancy-related challenges. This increased sense of self-efficacy may be particularly beneficial for primigravida women, who frequently experience heightened anxiety due to unfamiliarity with the childbirth process.

Despite the consistency of findings, the overall strength of evidence should be interpreted cautiously. Most studies included in this review employed quasi-experimental,

pre-experimental, or comparative observational designs rather than randomized controlled trials. Such methodologies may be susceptible to selection bias, confounding variables, and limited control over external influences. Additionally, sample sizes varied considerably across studies, ranging from 12 to 74 participants, which may affect statistical power and generalizability. Variations in anxiety assessment instruments and intervention protocols further contribute to methodological heterogeneity. Nevertheless, the fact that all reviewed studies reported reductions in anxiety provides compelling preliminary evidence supporting the psychological benefits of prenatal yoga.

From a clinical and midwifery perspective, these findings highlight the potential value of integrating prenatal yoga into routine antenatal care services. Given its relatively low cost, minimal risk, and ease of implementation, prenatal yoga may serve as an accessible strategy for addressing pregnancy-related anxiety while simultaneously promoting emotional well-being. Incorporating prenatal yoga into maternal healthcare programs may therefore contribute to more holistic and woman-centered approaches to antenatal care, in which psychological health is recognized as an essential component of overall maternal well-being.

Effects on Maternal Mental Well-Being and Childbirth Readiness: A Holistic Perspective

Beyond its role in reducing anxiety, the findings of this review indicate that prenatal yoga contributes substantially to broader dimensions of maternal mental well-being and psychological preparedness for childbirth. While anxiety reduction represents an important outcome, maternal mental health during pregnancy encompasses a wider range of psychological constructs, including emotional well-being, self-confidence, coping capacity, resilience, and readiness to face labor and delivery. Several studies included in this review suggest that prenatal yoga positively influences these dimensions, supporting its role as a holistic intervention within maternal healthcare (Astuti et al., 2023; Fitri et al., 2025).

Evidence regarding maternal mental well-being and childbirth readiness suggests that prenatal yoga influences broader psychological outcomes beyond anxiety reduction alone. However, the reviewed studies assessed different dimensions of psychological health. Fitri et al. (2025) focused on overall mental well-being using the WHO-5 Well-Being Index, whereas Astuti et al. (2023) examined fear of childbirth as a specific psychological outcome. Despite measuring different constructs, both studies reported favorable effects of prenatal yoga, indicating that its benefits may extend across multiple aspects of maternal psychological functioning.

The findings of Fitri et al. (2025) demonstrated that women participating in prenatal yoga reported significantly higher well-being scores than those receiving standard antenatal care. In contrast, Astuti et al. (2023) found that prenatal yoga was associated with lower levels of fear of childbirth and emerged as the strongest predictor of childbirth-related fear reduction. These findings suggest that prenatal yoga may simultaneously promote positive psychological states, such as well-being and resilience, while reducing negative emotional responses, including fear and worry. The convergence of findings across different psychological domains strengthens the argument that prenatal yoga functions as a holistic mind–body intervention rather than merely an anxiety-management strategy.

Some heterogeneity in findings may be attributed to differences in outcome measurement and participant characteristics. While Fitri et al. (2025) evaluated overall psychological well-being, Astuti et al. (2023) focused specifically on childbirth-related fear among primigravida women. Fear of childbirth is a more specific construct that may be strongly influenced by previous childbirth experience, perceived preparedness, and cultural beliefs regarding labor. Consequently, direct comparison between studies is challenging because each study captured different dimensions of maternal mental health. Nevertheless, the consistency of positive outcomes across diverse psychological measures suggests that prenatal yoga exerts broad psychological benefits throughout pregnancy.

The reduction in fear of childbirth observed among prenatal yoga participants may be explained through several mechanisms. First, breathing techniques and relaxation exercises help women develop practical coping skills that can be utilized during labor. By repeatedly practicing controlled breathing and relaxation strategies throughout pregnancy, women may become more confident in their ability to manage labor-related discomfort. Second, mindfulness practices encourage acceptance of physical sensations and emotional experiences, reducing catastrophic thinking and excessive worry regarding childbirth. Third, positive affirmations incorporated into prenatal yoga sessions may strengthen maternal confidence and self-efficacy, enabling women to approach labor with a more positive and realistic mindset.

The findings reported by Astuti et al. (2023) are particularly relevant from a clinical perspective because fear of childbirth has been associated with several adverse consequences. Previous evidence has linked elevated childbirth fear to increased maternal stress, prolonged labor duration, greater demand for pharmacological pain management, and higher rates of elective cesarean section. Consequently, interventions capable of reducing childbirth-related fear may provide benefits extending beyond psychological well-being alone. The observed reduction in fear among prenatal yoga participants therefore suggests potential implications for both maternal experiences and obstetric outcomes.

An additional aspect that deserves attention is maternal readiness for childbirth. Psychological readiness encompasses emotional preparedness, confidence, knowledge, and the ability to cope effectively with labor-related challenges. The reviewed studies collectively suggest that prenatal yoga may contribute to all of these components. Women who participate in prenatal yoga not only learn physical techniques for labor preparation but also develop greater awareness of their bodies and emotional responses. This holistic preparation may facilitate a smoother transition into childbirth and motherhood by enhancing both psychological and behavioral readiness.

An additional perspective was provided by Insani et al. (2024), who focused on knowledge and awareness regarding prenatal yoga rather than direct psychological outcomes. Although the study did not assess anxiety, well-being, or childbirth fear, its findings highlight an important factor that may influence intervention effectiveness, namely participant engagement and understanding. Increased knowledge regarding the benefits, timing, and implementation of prenatal yoga may encourage greater participation and adherence, thereby indirectly enhancing psychological outcomes.

The inclusion of educational findings introduces another source of heterogeneity

within the literature. While some studies evaluated clinical psychological outcomes, others focused on behavioral and educational aspects related to prenatal yoga participation. This diversity reflects the multifaceted nature of prenatal yoga programs but also complicates direct comparisons across studies. Nevertheless, the findings collectively suggest that successful implementation of prenatal yoga may depend not only on the intervention itself but also on women's understanding and acceptance of the practice.

Despite the positive findings reported across studies, some methodological limitations should be acknowledged. Mental well-being, childbirth fear, and readiness for labor were assessed using different instruments and conceptual frameworks, making direct comparisons between studies challenging. Furthermore, the available evidence primarily originates from quasi-experimental and observational studies, limiting causal inference. Differences in intervention duration, participant characteristics, and cultural contexts may also influence psychological outcomes. Nevertheless, the consistency of positive findings across multiple studies suggests that prenatal yoga has considerable potential as a holistic intervention for enhancing maternal mental well-being and preparing women psychologically for childbirth.

Overall, the evidence indicates that prenatal yoga provides benefits extending beyond anxiety reduction alone. By improving mental well-being, strengthening emotional resilience, reducing fear of childbirth, and enhancing childbirth preparedness, prenatal yoga supports a comprehensive approach to maternal health. These findings reinforce the value of integrating prenatal yoga into antenatal care programs as part of a woman-centered model of maternity care that addresses both physical and psychological dimensions of pregnancy.

Effects of Prenatal Yoga on Physical Health: Biomechanical and Physiological Perspectives

In addition to its psychological benefits, the findings of this review indicate that prenatal yoga exerts positive effects on various physical and physiological aspects of maternal health. Pregnancy is accompanied by substantial anatomical, biomechanical, and metabolic changes that frequently result in musculoskeletal discomfort, reduced mobility, and increased physiological demands. The studies included in this review suggest that prenatal yoga may serve as an effective non-pharmacological intervention for addressing these challenges through mechanisms involving both biomechanical adaptation and physiological regulation (Bara et al., 2024; Sukamti et al., 2022).

One of the most frequently reported physical complaints during pregnancy is pelvic girdle pain, particularly during the third trimester. As gestation progresses, enlargement of the uterus and increasing fetal weight alter the maternal center of gravity, resulting in postural changes and increased mechanical stress on the pelvis, lower back, and surrounding musculoskeletal structures. Hormonal changes, particularly increased production of relaxin, further contribute to ligament laxity and joint instability, increasing susceptibility to pain and discomfort. Consequently, pelvic girdle pain may interfere with daily activities, reduce mobility, impair sleep quality, and negatively affect overall quality of life.

Evidence regarding the physical effects of prenatal yoga was more heterogeneous than that observed for psychological outcomes. The reviewed studies assessed markedly different dimensions of maternal physical health, ranging from

musculoskeletal symptoms to physiological biomarkers. Sukamti et al. (2022) evaluated pelvic girdle pain as a clinical outcome directly experienced by pregnant women, whereas Bara et al. (2024) investigated biochemical markers related to iron metabolism, including hepcidin and ferritin levels. Although these outcomes cannot be directly compared, both studies reported favorable effects following prenatal yoga participation, suggesting that the intervention may influence maternal health through multiple biological and biomechanical pathways.

Sukamti et al. (2022) demonstrated a significant reduction in pelvic girdle pain among third-trimester pregnant women participating in prenatal yoga. In contrast, Bara et al. (2024) reported significant reductions in serum hepcidin levels following eight weeks of prenatal yoga, particularly among overweight pregnant women, although changes in ferritin levels did not reach statistical significance. These differences in findings may reflect variation in outcome sensitivity. Clinical symptoms such as pain may respond more rapidly to physical activity interventions, whereas physiological biomarkers are influenced by a broader range of factors, including nutritional status, inflammatory processes, body mass index, and individual metabolic characteristics.

The heterogeneity of outcomes also reflects differences in study populations and intervention objectives. Sukamti et al. (2022) focused on women experiencing pregnancy-related musculoskeletal discomfort during the third trimester, whereas Bara et al. (2024) examined physiological adaptation among pregnant women with varying metabolic profiles. Consequently, the observed benefits likely represent different manifestations of the same underlying intervention rather than contradictory findings. Together, these studies suggest that prenatal yoga may simultaneously improve functional well-being and support physiological adaptation during pregnancy.

When considered together, the findings of Sukamti et al. (2022) and Bara et al. (2024) highlight the multidimensional nature of prenatal yoga as a physical health intervention. While improvements in pelvic pain provide evidence of direct functional benefits that may enhance daily activities and quality of life, changes in iron-regulatory biomarkers suggest potential physiological adaptations occurring at a systemic level. However, the limited number of available studies and the diversity of outcome measures make it difficult to determine which physical benefits are most consistently supported by current evidence. This methodological heterogeneity represents an important limitation within the existing literature and underscores the need for future studies employing standardized outcome measures and intervention protocols.

From a clinical perspective, the available evidence supports the incorporation of prenatal yoga into routine antenatal care as a safe and accessible strategy for managing pregnancy-related discomfort and promoting physiological adaptation. By reducing pelvic pain, enhancing physical function, and potentially supporting iron metabolism, prenatal yoga may improve maternal quality of life and contribute to healthier pregnancy experiences. These benefits reinforce the value of prenatal yoga as a complementary component of holistic maternal healthcare that addresses both the physical and physiological needs of pregnant women.

Effects on Pregnancy Outcomes: Preventive and Health-Promoting Implications

The findings of this review suggest that the benefits of prenatal yoga extend beyond

improvements in psychological well-being and physical comfort, potentially influencing broader pregnancy outcomes. Although only one study directly examined obstetric outcomes, the collective evidence from the reviewed literature indicates that prenatal yoga may contribute to healthier pregnancies through multiple interconnected pathways involving physical activity, stress reduction, emotional regulation, and physiological adaptation. Consequently, prenatal yoga should be viewed not merely as a supportive intervention for symptom management but also as a potential preventive and health-promoting strategy within maternal healthcare.

Evidence regarding the influence of prenatal yoga on pregnancy outcomes remains more limited than evidence concerning psychological or physical outcomes. Among the studies included in this review, Thrower et al. (2026) was the only study that directly evaluated obstetric outcomes using a large prospective cohort design involving 7,502 nulliparous women. The study reported that prenatal yoga participation was associated with a lower risk of preterm birth and healthier gestational weight gain patterns. Compared with the predominantly quasi-experimental and observational studies included in other sections of this review, the large sample size and longitudinal follow-up strengthen the reliability of these findings. However, because the evidence is largely derived from a single study, conclusions regarding the direct impact of prenatal yoga on obstetric outcomes should be interpreted cautiously.

The findings of Thrower et al. (2026) are nevertheless consistent with the broader evidence identified in this review. Studies examining anxiety reduction, emotional well-being, and fear of childbirth consistently demonstrated improvements among women participating in prenatal yoga. These psychological benefits may contribute indirectly to healthier pregnancy outcomes through improved neuroendocrine regulation, reduced physiological stress responses, and enhanced adherence to healthy maternal behaviors. Therefore, the association between prenatal yoga and reduced preterm birth risk may reflect the cumulative influence of multiple psychological and physiological pathways rather than a single isolated mechanism.

A similar pattern can be observed when considering the physical and physiological outcomes reported in other studies. Improvements in pelvic girdle pain (Sukamti et al., 2022) may facilitate greater mobility and physical activity during pregnancy, whereas favorable changes in iron-regulatory biomarkers (Bara et al., 2024) may support maternal physiological adaptation. Although these outcomes were not directly linked to obstetric endpoints, they represent factors that may contribute to healthier pregnancy progression. Taken together, the evidence suggests that pregnancy outcomes may be influenced indirectly through the combined effects of improved psychological well-being, physical function, and physiological regulation.

Some heterogeneity should also be acknowledged when interpreting these findings. The reviewed studies differed substantially in intervention duration, frequency of practice, gestational age at intervention initiation, and outcome measurement. Furthermore, Thrower et al. (2026) assessed self-reported yoga participation within a large community-based cohort, whereas other studies evaluated structured prenatal yoga programs delivered under supervised conditions. These methodological differences may influence the magnitude of observed effects and limit direct comparisons across studies. Consequently, it remains difficult to

determine the optimal intensity, duration, or timing of prenatal yoga necessary to achieve favorable pregnancy outcomes.

An additional finding reported by Thrower et al. (2026) was the association between prenatal yoga and healthier gestational weight gain. Excessive or inadequate weight gain during pregnancy has been linked to a variety of maternal and neonatal complications, including gestational diabetes, hypertensive disorders, cesarean delivery, fetal growth abnormalities, and adverse long-term metabolic outcomes. As a moderate form of physical activity, prenatal yoga may help pregnant women maintain appropriate energy balance while simultaneously reducing psychological stress that can contribute to unhealthy eating behaviors. This dual effect highlights the unique advantage of prenatal yoga as a mind–body intervention capable of influencing both behavioral and physiological determinants of maternal health.

Despite these promising findings, several limitations within the current evidence base should be acknowledged. The strongest evidence regarding pregnancy outcomes derives primarily from a single large cohort study, whereas most other studies focused on intermediate outcomes such as anxiety, mental well-being, pain, or physiological parameters. Consequently, direct evidence linking prenatal yoga to improved obstetric outcomes remains relatively limited. Furthermore, observational studies cannot fully eliminate the possibility of residual confounding. Women who choose to participate in prenatal yoga may also engage in other health-promoting behaviors, possess higher health literacy, or have greater access to healthcare services, all of which may independently influence pregnancy outcomes.

Considerable heterogeneity was also observed across studies regarding intervention duration, frequency of practice, timing of initiation, and specific yoga protocols. Some studies evaluated structured prenatal yoga programs delivered over several weeks, whereas others assessed participation in community-based classes or self-reported yoga engagement. Such variations may influence the magnitude of observed benefits and complicate comparisons across studies. The absence of standardized prenatal yoga protocols represents an important methodological challenge that should be addressed in future research.

From a public health and midwifery perspective, the findings of this review support the integration of prenatal yoga into antenatal care services as part of a comprehensive strategy to promote maternal and fetal health. The intervention appears to provide multiple benefits across psychological, physical, physiological, and obstetric domains while maintaining a favorable safety profile. Furthermore, the educational findings reported by Insani et al. (2024) suggest that increasing awareness and knowledge regarding prenatal yoga may facilitate greater participation among pregnant women, thereby enhancing the potential population-level impact of such programs.

Future research should prioritize well-designed randomized controlled trials with larger and more diverse populations to establish causal relationships between prenatal yoga and pregnancy outcomes. Standardization of intervention protocols, outcome measures, and follow-up periods would also improve comparability across studies. Additionally, further investigations are needed to explore the biological and behavioral mechanisms through which prenatal yoga influences maternal and neonatal outcomes. Such evidence would strengthen the scientific basis for

incorporating prenatal yoga into evidence-based maternal healthcare policies and clinical practice guidelines.

Overall, the evidence synthesized in this review indicates that prenatal yoga is a promising complementary intervention that may contribute to improved pregnancy outcomes through its multidimensional effects on maternal psychological health, physical well-being, and physiological adaptation. Although further high-quality research is required, the current findings support the inclusion of prenatal yoga within holistic, woman-centered models of antenatal care aimed at optimizing maternal and fetal health throughout pregnancy.

SUMMARY

Based on the findings of this literature review, prenatal yoga demonstrated beneficial effects across multiple dimensions of maternal health during pregnancy. Most of the reviewed studies consistently reported reductions in anxiety, fear of childbirth, and pregnancy-related psychological distress among pregnant women participating in prenatal yoga programs. In addition, prenatal yoga was associated with improvements in mental well-being, emotional regulation, coping capacity, and psychological readiness for labor and delivery. Beyond its psychological benefits, prenatal yoga also contributed to reductions in pelvic girdle pain and musculoskeletal discomfort, improvements in physical function and postural adaptation, and favorable physiological changes related to iron metabolism, including reductions in serum hepcidin levels. Furthermore, evidence from a large prospective cohort study suggested that prenatal yoga may be associated with lower risks of adverse pregnancy outcomes, particularly preterm birth, as well as healthier gestational weight gain patterns. Collectively, these findings indicate that prenatal yoga may serve as a safe, accessible, and multidimensional non-pharmacological intervention capable of supporting both physical and psychological well-being during pregnancy.

Nevertheless, several limitations were identified within the reviewed literature. Considerable heterogeneity existed across studies regarding intervention protocols, duration and frequency of practice, participant characteristics, outcome measures, and study designs, which may limit direct comparability of findings. Most studies employed quasi-experimental, pre-experimental, or observational designs with relatively small sample sizes, thereby restricting the strength of causal inference. Furthermore, psychological outcomes were primarily assessed using self-reported instruments, while relatively few studies examined objective physiological or obstetric outcomes. Direct evidence regarding the effects of prenatal yoga on pregnancy outcomes remains limited, as only a small number of studies evaluated long-term maternal and neonatal endpoints. Therefore, future research should prioritize large-scale randomized controlled trials utilizing standardized prenatal yoga protocols, longer follow-up periods, and comprehensive assessments encompassing psychological, physiological, and obstetric outcomes. Further investigation is also warranted to determine the optimal duration, frequency, and timing of prenatal yoga interventions, as well as to evaluate their effectiveness across diverse maternal populations and healthcare settings.

ACKNOWLEDMENT

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

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