

Perinatal Yoga For Maternal Mental Health and Sleep Quality: A Randomized Controlled Trial

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Abstract

Background: The perinatal period involves substantial physiological and psychological changes that may negatively affect maternal mental health and sleep. Perinatal yoga may provide a safe, non-pharmacological approach to support maternal well-being.

Objective: This study aimed to examine the effects of a structured perinatal yoga programme on maternal mental health and sleep quality.

Methods: Sixty women in the perinatal period were randomly allocated into two groups: the perinatal yoga group (PYG = 30) and the control group (CG = 30). The PYG participated in a structured perinatal yoga programme comprising appropriate yogic postures, breathing practices, relaxation, and meditation for 16 weeks, while the CG continued routine activities. Maternal mental health and sleep quality were assessed before and after the intervention using validated psychological and sleep assessment tools. An independent t test was used to determine between-group differences.

Results: The perinatal yoga group (PYG) demonstrated significant reductions in stress (mean difference = -4.70, $p < 0.001$), depression (-3.66, $p < 0.001$), and anxiety (-5.56, $p < 0.001$) following the intervention when compared to the control group (CG). Furthermore, sleep quality saw a significant improvement in the PYG, with a mean difference of -2.56 ($p < 0.001$). The effect sizes ranged from moderate to large, indicating meaningful enhancements resulting from the yoga intervention.

Conclusion: A structured perinatal yoga programme appears to be an effective complementary intervention for enhancing maternal mental health and sleep quality. Incorporating appropriately adapted yoga practices into perinatal care may promote maternal well-being and support healthier adaptation during pregnancy and the postpartum period.

Keywords: Perinatal yoga; maternal mental health; sleep quality; pregnancy; postpartum.

Introduction

Pregnancy and postpartum are crucial times of physiological, psychological, and social adaptation. Pregnancy and childbirth are often good, but they can also cause psychological suffering, such as anxiety, depression, and stress. Early prevention and accessible supportive interventions are crucial to maternal healthcare because perinatal mental-health issues can negatively impact maternal functioning, quality of life, family connections, and newborn development. The WHO (2022) revealed that one in five women encounter a mental-health issue during pregnancy or the first year after childbirth, underlining the need to integrate mental-health promotion into routine maternal and child health services. Recent research shows that prenatal depression and anxiety vary globally, indicating the ongoing maternal psychological morbidity [1,22,27].

Perinatal psychological difficulties may endure beyond postpartum. Maternal depression and anxiety can persist beyond the first year after childbirth, suggesting that maternal psychological well-being should be considered throughout the lifecycle [6]. Many psychological and maternal factors linked with postpartum depression and stressed its repercussions for both mother and child health [11]. CBT has been shown to reduce prenatal depression, anxiety, and stress, although accessibility, treatment preferences, cost, and adherence may restrict its use in particular populations [9]. Thus, safe, acceptable, low-cost, and flexible complementary therapies are being studied.

Another important factor in perinatal maternal health is sleep. Hormonal, physical, emotional, and behavioural changes during pregnancy and postpartum can affect sleep duration and quality. Infant care, feeding, and circadian rhythms also interrupt sleep. Poor sleep quality increases during pregnancy, according to recent research. In a systematic review and meta-analysis of low- and middle-income nations, poor sleep prevalence

was 37% in the first trimester, 48% in the second, and 60% in the third [13]. Sleep disturbances may affect maternal psychological health as well as pregnancy-related physiological changes.

Sleep and prenatal mental health are linked, according to growing studies. The risk of postpartum and prenatal depression increases with poor sleep quality. Poor sleep during pregnancy was associated with greater rates of prenatal, postpartum, and perinatal depression in a meta-analysis of 39,574 women [8]. Poor sleep quality during pregnancy, especially later in pregnancy, reduces health-related quality of life [18]. Poor sleep can worsen emotional distress, whereas worry and depression can worsen sleep. Insomnia and poor sleep are linked to severe prenatal psychiatric consequences. Yoga interventions that address psychological well-being and sleep may be clinically relevant [16].

Due to its physical postures, controlled breathing, relaxation, mindfulness, and contemplative practices, yoga is becoming a viable maternal health intervention. Modified prenatal and postnatal yoga can meet the physiological needs of pregnancy and postpartum, unlike high-intensity exercise. Autonomic regulation, physiological arousal reduction, emotional regulation, bodily awareness, and relaxation responses may affect psychological and sleep results due to its multidimensionality.

Recent research suggests yoga may improve mother mental health. In a comprehensive review and meta-analysis, Lin et al. (2022) found that prenatal yoga reduces sadness and anxiety, however they noted evidence quality and heterogeneity [10]. Wang et al. (2022) proved that yoga reduced prenatal sadness and anxiety [26]. However, the methodological quality of the systematic reviews was often poor, highlighting the need for better-designed primary trials. Yoga may lower anxiety and tension in pregnant women, according to recent randomized trials [15, 23]. A systematic review of postnatal yoga therapies conducted by Munns et al. (2024) revealed reductions in symptoms of depression, along with improvements in psychological well-being and overall quality of life. However, the review noted that only a limited number of studies met the inclusion criteria, and there was significant variability in both the interventions used and the outcome measurements assessed. This research base is important because most yoga work has focused on pregnancy rather than perinatal treatments [14].

Research on yoga and maternal stress and sleep is also emerging. Integrated yoga with asanas and pranayama reduces stress and improves physiological markers in pregnant women [15]. In addition, current non-pharmacological intervention syntheses suggest that behavioural and mind-body methods may enhance pregnant sleep [17]. Most yoga research has assessed mental health or pregnancy-specific outcomes separately, while few studies have examined psychological health and sleep within a structured perinatal intervention.

Recent meta-analysis confirms this gap. Ranjbar et al. (2026) synthesized 35 studies on yoga during pregnancy and postpartum and found reductions in depression, anxiety, and stress, but also methodological limitations, low certainty of evidence, and a scarce evidence base for postpartum outcomes [20]. Prenatal yoga was found to significantly reduce anxiety but had mixed benefits on sadness and stress [3]. These literatures show that although yoga is promising, further well-controlled randomized trials employing standardized interventions and clinically significant outcome measures are required.

The study hypothesized that women participating in perinatal yoga would demonstrate significant improvements in mental-health outcomes and sleep quality than women receiving routine care alone. The present randomized controlled trial was designed to investigate the effects of a structured perinatal yoga programme on maternal mental health and sleep quality compared with routine care.

Methodology

Study Design and Participants. The present study employed a randomized controlled trial design to examine the effects of a structured perinatal yoga programme on maternal mental health and sleep quality among women in the perinatal period. Sixty women were recruited based on predefined eligibility criteria and randomly allocated into two equal groups: a perinatal yoga group (PYG = 30) and a control group (CG = 30). Participants were informed about the study procedures, potential benefits, and any possible risks before enrollment, and written informed consent was obtained from all participants.

Randomization and Group Allocation. Following baseline assessment, participants were randomly assigned to either the PYG or CG in a 1:1 ratio using a computer-generated randomization sequence. Allocation was performed independently of the outcome assessment to minimize selection bias. Baseline assessments were completed before commencement of the intervention, and post-intervention assessments were conducted following completion of the prescribed programme.

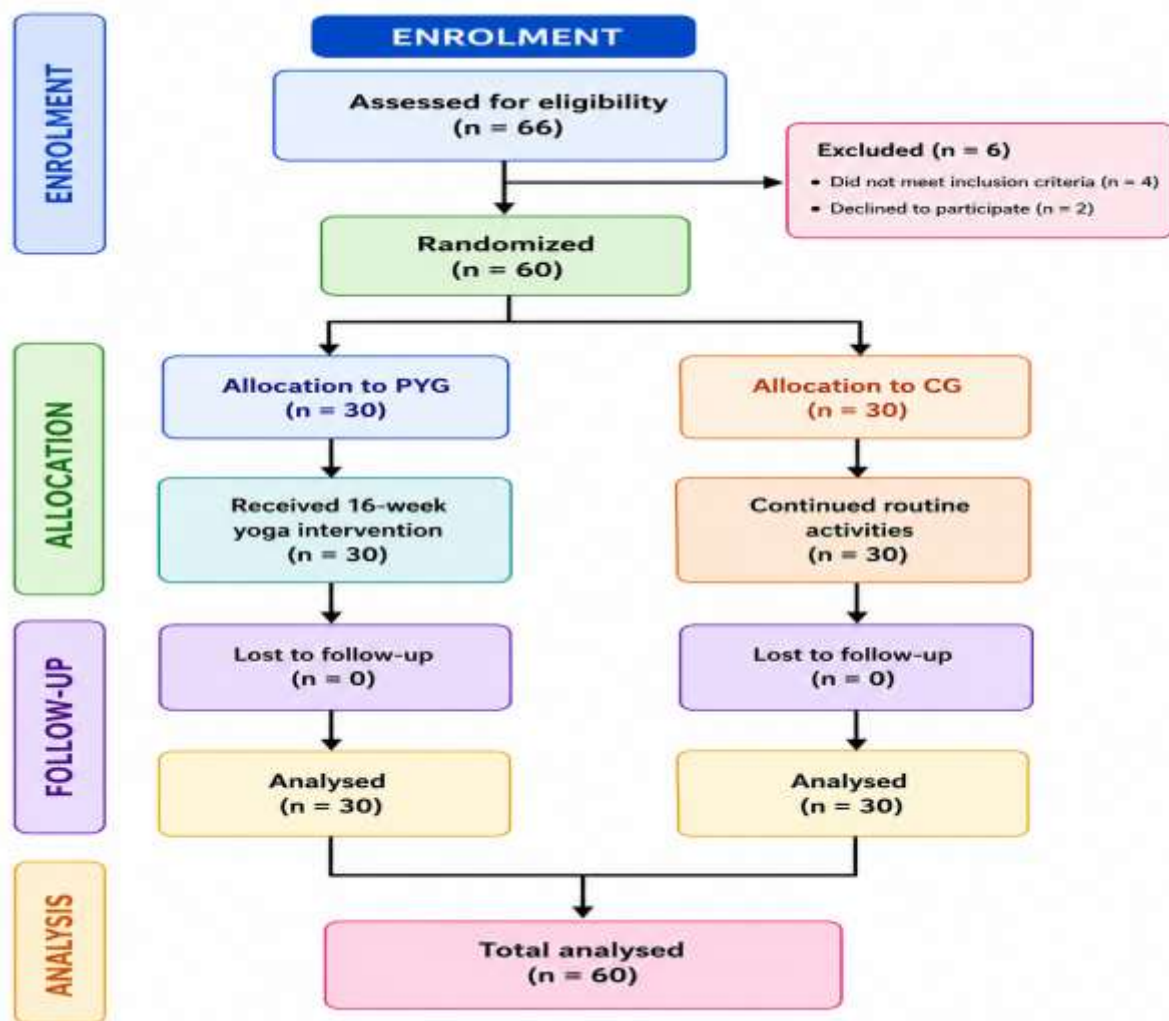


Figure.1- Participants Allocation Flowchart

Sample Size Determination: An a priori power analysis was conducted using G*Power version 3.1.9.7 to compare means between two independent groups. This analysis assumed an effect size of $d = 0.77$, an alpha level of 0.05, a statistical power of 0.90, a one-tailed test, and an equal allocation ratio of 1:1. The results indicated that a total sample size of 60 participants is required, with 30 participants assigned to each group.

Perinatal Yoga Intervention. Participants allocated to the PYG underwent a structured perinatal yoga programme for 16 weeks, with sessions conducted 3 days per week, approximately 45 minutes per session. The programme was specifically adapted to the physiological and safety requirements of the perinatal period. Each yoga session lasted 45 minutes and included four phases. The session began with 10 minutes of Sukshma Vyayama practices, which consisting of neck, shoulder, elbow, wrist, finger, ankle and knee movements, followed by gentle pelvic tilting, modified Marjariasana–Bitilasana, lateral bending, and diaphragmatic breathing. This was followed by 15 minutes of asanas and therapeutic yoga movements, which were selected and modified based on the participants’ gestational stage and individual tolerance. Pranayama practices lasted for 10 minutes, focusing on slow, controlled, and comfortable breathing. The session concluded with 10 minutes of relaxation and meditation, which featured practices such as guided relaxation, mindfulness, Yoga Nidra, or Shavasana. The overall program was conducted at a low to moderate intensity and was supervised by a qualified yoga instructor, with emphasis placed on correct technique, comfortable breathing, avoidance of excessive physical strain, and participant safety. The control group continued their routine daily activities and received no structured yoga intervention during the study period. Participants in both groups were requested to maintain their usual lifestyle and not initiate any new structured exercise, yoga, relaxation, or meditation programme during the intervention period. The detailed 16-week yoga intervention schedule for 45-minute training sessions is presented in Table 1.

Table.1 - Structured 16-Week Perinatal Yoga Intervention Protocol

Weeks	Asanas	Pranayama	Relaxation/ Meditation	Objectives
1–4	Tadasana, Marjariasana–Bitilasana, Baddha Konasana, Vajrasana, gentle pelvic movements	Diaphragmatic breathing, Anulom Vilom	Shavasana, mindfulness	Familiarization, breathing awareness and relaxation
5–8	Tadasana, supported Vrikshasana, Trikonasana (modified), Baddha Konasana, Upavistha Konasana (modified), pelvic tilts	Anulom Vilom, Bhramari	Guided relaxation	Flexibility, posture, balance and stress regulation
9–12	Marjariasana–Bitilasana, supported Malasana, modified Anjaneyasana, Setu Bandhasana (modified), Tadasana, Baddha Konasana	Diaphragmatic breathing, Anulom Vilom, Bhramari	Yoga Nidra, mindfulness	Pelvic mobility, functional strength and psychological well-being
13–16	Gentle standing, seated and supported restorative asanas; Baddha Konasana, modified Trikonasana, Marjariasana–Bitilasana	Slow yogic breathing, Anulom Vilom, Bhramari	Yoga Nidra, Shavasana, guided meditation	Relaxation, sleep quality, anxiety reduction and preparation for childbirth

Outcome Measures. Maternal mental health and sleep quality were assessed at baseline and immediately following the intervention using validated and reliable assessment instruments. Maternal mental health like stress, depression and anxiety were evaluated using the DASS 21 questionnaire, while sleep quality was assessed using the PSQI. A global PSQI score >5 is generally indicative of clinically significant poor sleep quality. The questionnaire was administered at baseline and immediately after the intervention under standardized conditions [2,12].

Statistical Analysis. Data were analysed using JASP software. Descriptive statistics were calculated and expressed as mean $\pm$ standard deviation (SD). The normality of the data was examined using the Shapiro–Wilk test, and homogeneity of variance was assessed using Levene's test. Baseline comparability between groups was examined before intervention. An independent-samples t test was used to determine between-group differences in post-intervention scores. The mean difference, 95% confidence interval, and corresponding p value were reported. Statistical significance was set at < 0.05. Effect sizes were also calculated where appropriate to determine the magnitude of the intervention effect.

Results

Table.2- Between-Group Differences in Stress, Depression, Anxiety, and Sleep Quality Following the Perinatal Yoga Intervention

Variables	Group	Mean $\pm$ SD		Mean Difference	95% CI for Mean Differences		t	p	Effect Size
		PYG	CG		Lower	Upper			

Stress	Pre	26.73±1.50	26.36±1.65	0.36	-0.45	1.18	0.89	0.37	0.23
	Post	20.76±1.99	25.46±1.67	-4.70	-5.65	-3.74	-9.88	<0.001*	-2.55
Depression	Pre	26.83±1.74	26.26±1.72	0.56	-0.32	1.46	1.26	0.21	0.32
	Post	20.23±2.26	23.90±2.05	-3.66	-4.78	-2.54	-6.55	<0.001*	-1.69
Anxiety	Pre	26.20±1.88	25.83±1.55	0.36	-0.52	1.25	0.82	0.41	0.21
	Post	19.76±1.85	25.33±1.93	-5.56	-6.54	-4.58	-11.38	<0.001*	-2.93
Sleep Quality	Pre	8.10±1.58	8.16±1.96	-0.06	-0.97	0.97	-0.14	0.88	-0.03
	Post	4.80±1.64	7.36±1.65	-2.56	-3.41	-1.71	-6.02	<0.001*	-1.55

PYG-Perinatal Yoga Group, CG-Control Group, SD- Standard Deviation, *Significance level $p < 0.001$

The independent-samples t-test was used to compare the Perinatal Yoga Group (PYG) and Control Group (CG) at pre- and post-intervention. The results indicate that the two groups were comparable at baseline, with no statistically significant differences in stress, depression, anxiety, or sleep quality ($p > 0.05$). At post-intervention, significant between-group differences were observed for all psychological and sleep-related variables ($p < 0.001$).

Changes in Stress: As shown in Table 2, the findings indicate a significant reduction in stress levels among participants who underwent the perinatal yoga intervention. In the Perinatal Yoga Group (PYG), the mean stress score decreased from 26.73 ± 1.50 at pre-test to 20.76 ± 1.99 at post-test, suggesting a marked improvement following the intervention. In contrast, the Control Group (CG) exhibited only a modest reduction, from 26.36 ± 1.65 to 25.46 ± 1.67 . The post-intervention comparison revealed a mean difference of -4.70 points between the groups, with a 95% confidence interval ranging from -5.65 to -3.74 . The obtained t value of -9.88 corresponded with a highly significant p value (< 0.001), indicating that the reduction in stress within the PYG was significantly greater than that in the CG. Moreover, the effect size ($d = -2.55$) was very large, signifying that the magnitude of the intervention's effect was substantial, not merely statistically significant. These findings suggest that structured perinatal yoga may be particularly effective in reducing perceived stress among women during the perinatal period.

Changes in Depression: As shown in Table 2, significant improvement in depressive symptoms was observed following the perinatal yoga intervention. The mean depression score in the Perinatal Yoga Group (PYG) decreased from 26.83 ± 1.74 before the intervention to 20.23 ± 2.26 after the intervention, indicating a notable reduction in the severity of depressive symptoms. In contrast, the Control Group (CG) exhibited a smaller decrease, from 26.26 ± 1.72 to 23.90 ± 2.05 . The post-intervention mean difference between the groups was -3.66 points, with a 95% confidence interval of -4.78 to -2.54 . The statistical analysis yielded a t value of -6.55 with a highly significant p value (< 0.001), indicating a statistically significant difference between the groups. Furthermore, the effect size ($d = -1.69$) was very large, demonstrating a strong practical effect of the intervention. These results suggest that perinatal yoga may meaningfully contribute to reducing depressive symptoms and enhancing psychological well-being during the perinatal period.

Changes in Anxiety: The most significant between-group improvement among the psychological variables was noted for anxiety. As shown in Table 2, Participants in the PYG exhibited a marked reduction in anxiety scores, with the mean decreasing from 26.20 ± 1.88 at baseline to 19.76 ± 1.85 after the intervention. In contrast, the CG showed only a slight change, with scores dropping from 25.83 ± 1.55 to 25.33 ± 1.93 . The post-intervention comparison revealed a mean difference of -5.56 points, with the corresponding 95% confidence interval ranging from -6.54 to -4.58 . The t value of -11.38 and the associated p value of < 0.001 reflect a highly statistically significant difference between the groups. Additionally, the effect size ($d = -2.93$) was exceptionally large, representing the strongest effect observed among the variables assessed. This finding implies that perinatal yoga may have a notably positive impact on anxiety symptoms. The combination of a substantial reduction in the PYG,

minimal change in the CG, highly significant statistical results, and a very large effect size offers compelling evidence for the effectiveness of perinatal yoga in managing anxiety during the perinatal period.

Changes in Sleep Quality: As shown in Table 2, the results indicated a significant improvement in sleep quality following the perinatal yoga intervention. The Perinatal Yoga Group (PYG) exhibited a reduction in the mean sleep-quality score from 8.10 ± 1.58 at pre-test to 4.80 ± 1.64 at post-test. In contrast, the Control Group (CG) showed a smaller decrease, from 8.16 ± 1.96 to 7.36 ± 1.65 . Assuming the Pittsburgh Sleep Quality Index (PSQI) was utilized, a lower score indicates better sleep quality; thus, the notable reduction in the PYG reflects a meaningful enhancement in sleep quality. The post-intervention mean difference between the groups was -2.56 points, with a 95% confidence interval ranging from -3.41 to -1.71 . The obtained t value of -6.02 , along with a p value of < 0.001 , supports the conclusion that the improvement in sleep quality for the PYG was significantly greater than that for the CG. The effect size ($d = -1.55$) was categorized as very large, indicating a substantial degree of improvement. These findings imply that perinatal yoga may have a positive impact on sleep quality, potentially enhancing overall psychological and physical well-being during the perinatal period.

Discussion

The present study investigated the effects of a structured perinatal yoga programme on maternal mental health and sleep quality. The findings demonstrated significant improvement in sleep quality and notable reductions in stress, depression and anxiety. These findings are consistent with the systematic review and meta-analysis by Ding et al. (2022), which reported significant reductions in perceived stress following pregnancy yoga interventions. Their analysis suggested that interventions involving repeated yoga sessions and adequate session duration may be particularly beneficial for reducing perceived stress [4]. Similarly, an overview of systematic reviews reported that the majority of available meta-analyses demonstrated beneficial effects of prenatal yoga on stress, anxiety, and depression, although the authors emphasized methodological limitations in the existing evidence base [25]. The substantial reduction in stress in the present study may be attributed to the multidimensional nature of yoga, which generally integrates physical postures, controlled breathing, relaxation, and meditative or mindfulness-based components. These components may promote autonomic regulation and improve emotional self-regulation, thereby reducing psychological responses to pregnancy- and childbirth-related stressors. The importance of stress regulation during the perinatal period is particularly relevant because persistent maternal stress is closely associated with anxiety and depressive symptoms. A recent systematic review highlighted the important role of stress-related processes in the development and maintenance of perinatal depression and anxiety [21]. Thus, the marked reduction in stress observed in the present study may have broader implications for maternal psychological well-being.

Lin et al. (2022), in a systematic review and meta-analysis of 13 studies involving 379 participants, reported significant improvements in depression among pregnant women with depressive symptoms who participated in prenatal yoga [10]. Their findings also demonstrated beneficial effects on anxiety, although they noted limitations in the methodological quality of the available evidence. The present findings are further supported by Jarbou & Newell (2022), who reviewed exercise and yoga interventions during pregnancy and reported that yoga-based interventions were among the approaches showing improvements in depressive and anxiety symptoms. However, their review also noted that some control groups demonstrated improvements, indicating that the magnitude of benefit may vary according to intervention characteristics and study design [7]. More recent evidence continues to support a potential antidepressant effect of yoga during the perinatal period. The large reduction in depression observed in the present study adds further evidence that structured perinatal yoga may be a useful complementary strategy for improving maternal emotional health.

Lin et al. (2022) reported significant reductions in anxiety among pregnant women receiving prenatal yoga, particularly among women presenting with depressive symptoms [10]. Similarly, Ding et al. (2022) reported a significant reduction in anxiety following pregnancy yoga, with a pooled standardized mean difference of -0.91 [4]. The strong improvement in anxiety observed in the present study may reflect the combined effects of physical activity, breathing regulation, relaxation, and attentional control incorporated into yoga practice. Controlled breathing and relaxation techniques may help reduce physiological arousal, while mindfulness-oriented components may facilitate greater awareness and regulation of anxious thoughts. In addition, regular participation in a structured intervention may provide women with a sense of control and confidence during a period characterized by substantial physical and emotional changes.

The findings of the present study are also consistent with the broader evidence base supporting yoga as a complementary approach to perinatal mental health care. A recent systematic review and meta-analysis

published in Best Practice & Research Clinical Obstetrics & Gynaecology synthesized 35 studies, including 23 randomized controlled trials, and found that yoga was associated with reductions in prenatal depression, anxiety, and stress. The pooled effects were approximately -0.98 for depression, -1.15 for anxiety, and -0.88 for stress. However, the authors emphasized that the certainty of evidence remained low to very low because of methodological limitations and heterogeneity between studies [20].

Thamaraiselvi et al. (2025) conducted a study that demonstrated a substantial enhancement in sleep quality and memory agility following a 16-week yoga intervention. Specifically, the yoga group experienced a significant decrease in sleep quality scores, dropping from (7.93 ± 1.62) to (4.93 ± 1.67) . This indicates a marked improvement in sleep quality after the intervention. In contrast, the control group exhibited negligible changes in sleep parameters, maintaining a score of (7.88 ± 1.77) [24]. This research also showed a significant improvement in sleep quality for the perinatal yoga group when compared to the control group. The present study therefore contributes additional controlled evidence supporting the potential effectiveness of perinatal yoga while also highlighting the need for adequately powered, well-controlled trials with standardized intervention protocols.

Conclusion. The findings indicate that a sixteen-week structured perinatal yoga may provide a multidimensional benefit for maternal psychological well-being and sleep. Rather than targeting a single symptom, yoga simultaneously addresses physical activity, breathing regulation, relaxation, and psychological self-regulation, which may explain the consistent improvements observed across stress, depression, anxiety, and sleep quality. The results support the incorporation of appropriately designed perinatal yoga programmes as a complementary component of maternal health services, particularly for women experiencing psychological distress or sleep difficulties. However, yoga should be viewed as a complementary intervention rather than a replacement for evidence-based clinical assessment and treatment when clinically significant mental health conditions are present.

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