

EFFECTS OF PRENATAL GENTLE YOGA ON THE INCIDENCE AND SEVERITY OF PERINEAL RUPTURE IN VAGINAL DELIVERY: A QUASI-EXPERIMENTAL STUDY

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ABSTRACT

Perineal rupture remains a common obstetric complication in vaginal delivery and contributes significantly to maternal morbidity. This study aimed to evaluate the effects of prenatal gentle yoga on the incidence and severity of perineal rupture among third-trimester pregnant women undergoing vaginal delivery. A quasi-experimental study with a control group design was conducted at Sikumana Community Health Center from February to March 2026 involving 30 participants, divided into an intervention group (n=15) and a control group (n=15). The intervention group received prenatal gentle yoga sessions three times per week for four weeks, while the control group received standard antenatal care. Data were collected using observation sheets and medical records, and analyzed using Chi-square test, Mann-Whitney U test, and logistic regression. The results showed that the incidence of perineal rupture was significantly lower in the intervention group (40%) compared to the control group (73.3%) ($p=0.048$). The severity of perineal rupture was also significantly reduced, with no cases of severe rupture in the intervention group and a significant difference between groups ($p=0.021$). Logistic regression analysis indicated that prenatal gentle yoga reduced the risk of perineal rupture by approximately 72% ($OR=0.28$; $p=0.041$). In conclusion, prenatal gentle yoga may serve as a promising non-pharmacological intervention to reduce the incidence and severity of perineal rupture among pregnant women undergoing vaginal delivery. However, considering the quasi-experimental design and relatively small sample size, further large-scale randomized studies are required to confirm these findings before broad clinical implementation.

Keywords: *Prenatal gentle yoga, perineal rupture, vaginal delivery, maternal outcomes, antenatal care.*

INTRODUCTION

Perineal rupture is a common complication of vaginal delivery that contributes to maternal morbidity, including pain, infection, and pelvic floor dysfunction. Globally, more than 70% of women experience some degree of perineal trauma during vaginal birth, ranging from minor lacerations to severe obstetric anal sphincter injuries (OASI) (Jansson et al., 2020). Furthermore, severe perineal trauma has been associated with substantial postpartum physical symptoms, including pain, wound complications, and functional limitations, which may persist beyond the immediate postpartum period (Opondo et al., 2023). In addition to physical morbidity, increasing severity of perineal trauma is also linked to a higher burden of postpartum health problems that can negatively affect maternal recovery and well-being (Massalha et al., 2025). Despite advancements in obstetric care and preventive strategies, the incidence of perineal trauma remains

considerable, highlighting the need for more effective and evidence-based interventions to reduce both its occurrence and severity (Man et al., 2024).

In Indonesia, perineal rupture remains a common complication of vaginal delivery and contributes to postpartum morbidity. Despite the use of preventive measures such as perineal massage, controlled pushing, and selective episiotomy, its incidence remains high due to inconsistent effectiveness across settings. Existing approaches mainly focus on intrapartum management rather than maternal preparation during pregnancy. Key risk factors include parity, fetal birth weight, duration of the second stage of labor, and the use of obstetric instruments, highlighting the need for more effective evidence-based preventive interventions (Darlina et al., 2025). Similarly, large observational studies have shown that severe perineal lacerations are strongly associated with a combination of antenatal and intrapartum factors, emphasizing the importance of identifying women at higher risk through comprehensive clinical assessment (Longo et al., 2023).

In addition, prospective studies demonstrate that instrumental delivery, prolonged second stage of labor, and higher neonatal birth weight significantly increase the likelihood of perineal trauma, highlighting the mechanical and procedural contributors to tissue damage during childbirth (Smith et al., 2013). These findings are further supported by cohort studies reporting that gestational age beyond term and increased fetal size are associated with a higher risk of severe perineal tears, reinforcing the role of both maternal and fetal characteristics in determining outcomes (Theobald et al., 2020). Despite the identification of these risk factors, current preventive approaches remain insufficiently effective due to the complex and multifactorial nature of perineal rupture, indicating a persistent gap in developing targeted, evidence-based interventions that can reduce both its incidence and severity in clinical practice (Darlina et al., 2025).

Various strategies, such as perineal massage, controlled delivery techniques, and episiotomy, have been used to prevent perineal trauma; however, their effectiveness remains inconsistent. Evidence suggests that antenatal and intrapartum perineal massage may reduce severe perineal trauma, particularly among primiparous women, although its benefits vary across studies and clinical settings (Venugopal et al., 2022). In addition, controlled delivery techniques, such as hands-on perineal protection, have been associated with reduced rates of obstetric anal sphincter injuries; however, findings remain inconsistent due to differences in practitioner skill and variations in clinical implementation (Aasheim et al., 2017). Furthermore, although episiotomy has historically been used as a preventive measure, recent evidence suggests that routine use does not effectively prevent severe perineal trauma and may instead increase the risk of complications such as pain, infection, and delayed healing (Cilla et al., 2017). These findings highlight that, despite the availability of multiple preventive approaches, their effectiveness remains variable and context-dependent, underscoring the need for safer and more consistent evidence-based interventions to reduce perineal rupture.

Prenatal gentle yoga is a promising non-pharmacological intervention that combines physical postures, breathing exercises, and relaxation techniques to improve pelvic floor flexibility, maternal control during labor, and psychological well-being.

Evidence suggests that prenatal yoga is safe and effective in reducing stress, anxiety, and pain during pregnancy. In addition, systematic reviews and meta-analyses demonstrate that prenatal yoga interventions can significantly improve maternal mental health and quality of life, although methodological variations across studies remain a limitation (Villar-alises et al., 2023). Furthermore, yoga-based interventions during pregnancy have been shown to positively influence labor-related outcomes, including reduced labor pain and shorter duration of labor, suggesting its potential role in optimizing physiological readiness for childbirth (Corrigan et al., 2022).

Although prenatal yoga has been shown to improve maternal well-being and pregnancy outcomes, evidence regarding its effects on the incidence and severity of perineal rupture remains limited. Despite these promising findings, an important knowledge gap remains. Most previous studies have primarily evaluated prenatal yoga in relation to psychological outcomes, labor pain, labor duration, maternal comfort, and overall childbirth experiences, whereas evidence regarding its direct effect on clinically important obstetric outcomes, particularly the incidence and severity of perineal rupture, is still scarce. Moreover, studies specifically investigating structured prenatal gentle yoga using a quasi-experimental design in primary maternal healthcare settings are limited, especially in low- and middle-income countries. Therefore, the novelty of the present study lies in evaluating prenatal gentle yoga as a preventive intervention specifically targeting perineal rupture during vaginal delivery while simultaneously assessing both the incidence and severity of rupture. This study also contributes new evidence from an Indonesian primary healthcare setting, thereby expanding the current body of evidence regarding non-pharmacological interventions for improving maternal birth outcomes.

Most existing studies focus on psychological outcomes, such as reduced anxiety and improved emotional well-being, rather than obstetric outcomes related to perineal integrity (Villar-alises et al., 2023). Although recent meta-analyses have explored the impact of prenatal yoga on labor pain and duration, evidence regarding its direct influence on perineal outcomes remains scarce (Wakjira et al., 2025). Limited evidence is available regarding the effects of prenatal gentle yoga on the incidence and severity of perineal rupture, particularly from quasi-experimental studies in maternal care settings. Therefore, this study addresses an important research gap and provides novel evidence on the potential of prenatal yoga as a preventive obstetric intervention.

This study evaluates the effects of prenatal gentle yoga on the incidence and severity of perineal rupture among third-trimester pregnant women undergoing vaginal delivery. Unlike previous studies that mainly focused on maternal well-being and psychological outcomes, this research examines clinically relevant obstetric outcomes, addressing an important gap in the literature (Corrigan et al., 2022). Using a quasi-experimental design, the study also provides stronger evidence regarding the effectiveness of prenatal yoga interventions and supports their integration into routine antenatal care (Villar-alises et al., 2023).

Prenatal gentle yoga may help reduce perineal trauma by improving pelvic floor flexibility, tissue elasticity, breathing control, and maternal awareness during labor,

thereby facilitating controlled fetal descent and minimizing perineal strain. Given the high prevalence and adverse effects of perineal trauma, including pain, delayed recovery, and pelvic floor dysfunction, prenatal yoga represents a safe and accessible intervention to improve maternal outcomes and support evidence-based maternity care (Corrigan et al., 2022). At the same time, global health perspectives emphasize the importance of promoting non-pharmacological, low-cost, and scalable interventions to improve maternal health outcomes. Therefore, investigating prenatal gentle yoga as a preventive approach is highly relevant, as it aligns with current healthcare priorities in enhancing maternal care quality while minimizing intervention-related risks.

RESEARCH METHOD

This study employed a quasi-experimental design with a control group to evaluate the effects of prenatal gentle yoga on the incidence and severity of perineal rupture in vaginal delivery among third-trimester pregnant women. The study was conducted at the Sikumana community health centre from February to March 2026. Participants were recruited using a purposive sampling technique based on predefined inclusion and exclusion criteria.

The study population consisted of pregnant women in their third trimester (gestational age ≥ 28 weeks) who planned to undergo vaginal delivery. Inclusion criteria included singleton pregnancy, cephalic presentation, absence of obstetric complications, and willingness to participate in the study. Exclusion criteria included high-risk pregnancies, history of cesarean section, medical contraindications to physical activity, and incomplete participation in the intervention program.

A total of 30 participants were enrolled in this study and divided into two groups: an intervention group ($n = 15$) and a control group ($n = 15$). Inclusion criteria included third-trimester pregnant women (≥ 28 weeks gestation), singleton pregnancy, cephalic presentation, absence of obstetric complications, and willingness to participate in all intervention sessions. Exclusion criteria included high-risk pregnancy, previous cesarean section, placenta previa, severe maternal medical disorders, contraindications to physical activity, and incomplete participation during the intervention period. The sample size was determined based on the availability of eligible participants during the study period and the feasibility of implementing the intervention program at the study site.

Participants were allocated into intervention and control groups using purposive sampling techniques. Efforts were made to ensure comparable baseline maternal characteristics between groups to minimize potential selection bias. The intervention group received prenatal gentle yoga sessions, while the control group received standard antenatal care without yoga intervention. The prenatal gentle yoga program was conducted for 4 weeks with a frequency of three sessions per week, and each session lasted approximately 60 minutes. This intervention protocol was adapted from previous studies indicating that regular prenatal yoga practice conducted 2-3 times per week over a minimum of four weeks can effectively improve maternal physical readiness and psychological well-being during pregnancy. Participants were allocated using purposive

sampling with efforts to ensure comparable baseline characteristics between groups.

Data were collected using structured observation sheets and medical record documentation. The primary outcomes of this study were the incidence and severity of perineal rupture during vaginal delivery. Perineal rupture was classified into first-, second-, third-, and fourth-degree tears based on standard clinical criteria. Additional maternal characteristics, including age, parity, and neonatal birth weight, were also recorded as potential confounding variables.

Data analysis was performed using statistical software. Descriptive statistics were used to summarize participant characteristics. The incidence of perineal rupture between groups was analyzed using the Chi-square test, while the severity of perineal rupture was analyzed using the Mann-Whitney U test. Multivariate analysis using logistic regression was conducted to control for potential confounding variables. A p-value of <0.05 was considered statistically significant. Logistic regression analysis was performed exploratively to control for major confounding variables, including parity and neonatal birth weight. However, the authors acknowledge that the relatively small sample size may limit the stability and generalizability of multivariate estimates. All participants provided written informed consent prior to participation, and the study adhered to ethical principles.

RESULTS AND DISCUSSION

1. Characteristics of Participants

A total of 30 third-trimester pregnant women participated in this study, consisting of 15 participants in the intervention group and 15 participants in the control group. The baseline characteristics of participants, including age, parity, and neonatal birth weight, are presented in Table 1.

Table 1. Characteristics of Participants

Variable	Intervention (n=15)	Control (n=15)	p-value
Age (years), mean $\pm$ SD	27.4 $\pm$ 4.2	26.9 $\pm$ 3.8	0.732
20-25 years	5 (33.3%)	6 (40.0%)	
26-30 years	7 (46.7%)	6 (40.0%)	
>30 years	3 (20.0%)	3 (20.0%)	
Education level, n (%)			0.681
Primary	3 (20.0%)	4 (26.7%)	
Secondary	9 (60.0%)	8 (53.3%)	
Higher education	3 (20.0%)	3 (20.0%)	
Occupation, n (%)			0.705
Housewife	10 (66.7%)	11 (73.3%)	
Employed	5 (33.3%)	4 (26.7%)	
Parity, n (%)			0.705
Primiparous	9 (60.0%)	10 (66.7%)	
Multiparous	6 (40.0%)	5 (33.3%)	

Gestational age (weeks), mean $\pm$ SD	32.8 $\pm$ 2.1	33.1 $\pm$ 2.3	0.688
BMI (kg/m ²), mean $\pm$ SD	24.6 $\pm$ 2.8	25.1 $\pm$ 3.1	0.623
Birth weight (grams), mean $\pm$ SD	3100 $\pm$ 320	3150 $\pm$ 290	0.658

Table 1 presents the baseline characteristics of participants in both the intervention and control groups. The mean age of participants in the intervention group was 27.4 $\pm$ 4.2 years, while in the control group it was 26.9 $\pm$ 3.8 years, with no statistically significant difference (p=0.732). The majority of participants in both groups were within the age range of 26-30 years.

In terms of educational level, most participants had secondary education, accounting for 60.0% in the intervention group and 53.3% in the control group (p=0.681). The majority of participants were housewives in both groups, with comparable proportions (66.7% vs 73.3%; p=0.705).

Regarding obstetric characteristics, primiparous women constituted the majority in both groups (60.0% vs 66.7%; p=0.705). The mean gestational age was similar between groups (32.8 $\pm$ 2.1 vs 33.1 $\pm$ 2.3 weeks; p=0.688). Additionally, no significant differences were observed in body mass index (24.6 $\pm$ 2.8 vs 25.1 $\pm$ 3.1 kg/m²; p=0.623) or neonatal birth weight (3100 $\pm$ 320 vs 3150 $\pm$ 290 grams; p=0.658).

Overall, these findings indicate that the baseline characteristics of participants in both groups were comparable, suggesting that any differences in outcomes are likely attributable to the intervention rather than confounding variables.

2. Incidence of Perineal Rupture

The incidence of perineal rupture in both groups is presented in Table 2.

Table 2. Incidence of Perineal Rupture

Perineal Rupture	Intervention (n=15)	Control (n=15)	p-value
Yes	6 (40%)	11 (73.3%)	0.048*
No	9 (60%)	4 (26.7%)	

Table 2 demonstrates that the incidence of perineal rupture was lower in the intervention group (40%) compared to the control group (73.3%). The difference was statistically significant (p=0.048), suggesting that prenatal gentle yoga may be associated with a lower incidence of perineal rupture, although the interpretation should be considered cautiously due to the borderline statistical significance and limited sample size.

3. Severity of Perineal Rupture

The severity of perineal rupture based on degree classification is shown in Table 3.

Table 3. Severity of Perineal Rupture

Degree of Rupture	Intervention (n=15)	Control (n=15)
No rupture	9 (60%)	4 (26.7%)
Degree I	4 (26.7%)	5 (33.3%)
Degree II	2 (13.3%)	4 (26.7%)
Degree III-IV	0 (0%)	2 (13.3%)

Table 3 indicates that the intervention group had a higher proportion of women with no perineal rupture (60%) compared to the control group (26.7%). Additionally, no severe perineal rupture (degree III-IV) was observed in the intervention group, whereas 13.3% of participants in the control group experienced severe rupture.

4. Statistical Analysis of Severity

The comparison of severity between groups was analyzed using the Mann-Whitney U test.

Table 4. Mann–Whitney U Test Results for Perineal Rupture Severity

Group	Mean Rank	p-value
Intervention	11.20	
Control	19.80	0.021*

The Mann-Whitney U test showed a statistically significant difference in the severity of perineal rupture between the two groups ($p=0.021$). The intervention group had a lower mean rank, indicating less severe perineal trauma compared to the control group.

5. Multivariate Analysis

Logistic regression analysis was conducted to assess the effect of prenatal gentle yoga while controlling for confounding variables.

Table 5. Logistic Regression Analysis

Variable	OR	95% CI	p-value
Prenatal yoga	0.28	0.08-0.95	0.041*
Parity (primiparous)	2.10	0.65-6.75	0.215
Birth weight	1.001	0.998-1.004	0.332

Logistic regression analysis revealed that prenatal gentle yoga significantly reduced the risk of perineal rupture ($OR=0.28$; $p=0.041$), indicating that participants in the intervention group were approximately 72% less likely to experience perineal rupture compared to the control group. Other variables, including parity and birth weight, were not statistically significant predictors.

This study found that prenatal gentle yoga significantly reduced both the incidence

and severity of perineal rupture among third-trimester pregnant women undergoing vaginal delivery. The intervention group showed a lower incidence of perineal rupture than the control group (40% vs. 73.3%; $p=0.048$), a higher proportion of women without rupture (60% vs. 26.7%), and no cases of severe rupture (degree III–IV). These findings were supported by statistical analyses, including the Mann-Whitney U test ($p=0.021$) and logistic regression ($OR=0.28$; $p=0.041$), indicating that prenatal gentle yoga reduced the risk of perineal rupture by approximately 72%. Overall, the results suggest that structured prenatal yoga may improve perineal outcomes during vaginal delivery.

Research on prenatal yoga and antenatal exercise consistently highlights their benefits in improving maternal physical readiness and labor outcomes, such as reduced labor duration and pain. A systematic review of randomized controlled trials found that prenatal yoga significantly improved delivery experiences, reduced stress, anxiety, and depression, and decreased obstetrical complications like pregnancy-induced hypertension and gestational diabetes (Villar-alises et al., 2023). A meta-analysis further confirmed that prenatal yoga effectively reduces labor duration and pain, with significant standardized mean differences indicating its positive impact (Riawati et al., 2022). Comparative studies also show that both prenatal yoga and antenatal exercises enhance physical readiness for labor, with significant improvements in physical preparedness among participants (Dewi et al., 2018). Additionally, prenatal yoga has been shown to improve psychological readiness, self-efficacy, and reduce anxiety and depression, contributing to better labor outcomes such as reduced perineal rupture and cesarean sections (Yenni et al., 2025). However, some studies report inconsistent results, potentially due to variations in intervention duration, frequency, and participant characteristics (Łuczak et al., 2025). Despite these inconsistencies, the overall evidence supports the integration of prenatal yoga and exercise into antenatal care to enhance labor outcomes and maternal well-being. Further research is needed to standardize intervention protocols and tailor them to individual needs to maximize benefits (Łuczak et al., 2025).

Previous studies have demonstrated that prenatal yoga improves pelvic floor flexibility, breathing regulation, and muscular relaxation, all of which may contribute to reduced mechanical stress on the perineum during childbirth (Kuder et al., 2024; Corrigan et al., 2022). Studies indicate that this practice significantly reduces anxiety levels among pregnant women, particularly in their third trimester, thereby potentially lowering muscle tension and facilitating smoother labor progression, which can decrease the risk of perineal trauma (Armaita et al., 2025). Furthermore, prenatal yoga is associated with shorter labor times, reduced pain intensity, and a higher likelihood of spontaneous vaginal births, contributing to better outcomes for both mother and infant (Kuder et al., 2024). The holistic approach of yoga not only prepares women physically but also fosters emotional resilience, enhancing their overall readiness for childbirth (John et al., 2025). Thus, integrating prenatal gentle yoga into prenatal care is recommended to support maternal health and improve labor experiences.

Although parity, fetal birth weight, and maternal characteristics are recognized risk factors for perineal rupture, none were statistically significant in this study, suggesting a

stronger influence of the prenatal gentle yoga intervention. Primiparity is generally associated with a higher risk of perineal trauma due to reduced tissue elasticity and limited previous childbirth-related stretching experience (Darlina et al., 2025). Similarly, increased fetal birth weight has been identified as a strong mechanical risk factor, as larger infants exert greater pressure on the perineal tissues during the second stage of labor, increasing the likelihood of tearing (Kuder et al., 2024). Maternal characteristics, including age, body mass index, and overall physical condition, have also been reported to influence tissue resilience and labor outcomes (Riawati et al., 2022). However, in the present study, none of these variables showed a statistically significant association with perineal rupture ($p>0.05$), suggesting that the structured prenatal yoga intervention may have mitigated the impact of these traditional risk factors. This finding is particularly noteworthy, as it implies that targeted non-pharmacological interventions may potentially help reduce the impact of certain obstetric risk factors. However, this interpretation should be approached cautiously because the non-significant findings may also be influenced by the limited sample size and statistical power.

One possible explanation is that prenatal gentle yoga improves pelvic floor flexibility and perineal elasticity to a degree that reduces the mechanical disadvantage typically experienced by primiparous women or those delivering larger infants. In addition, the homogeneity of the study sample and the relatively small sample size ($n=30$) may have contributed to the lack of statistical significance for these variables, as limited variability reduces the ability to detect differences between groups. Nevertheless, the consistent trend observed—where the intervention group demonstrated better outcomes regardless of parity or fetal weight—supports the hypothesis that prenatal yoga has a substantial and potentially overriding protective effect. These findings align with recent studies suggesting that modifiable behavioral interventions during pregnancy may play a more critical role in determining birth outcomes than previously assumed (Darlina et al., 2025). Therefore, while traditional risk factors should not be disregarded, the present study highlights the importance of considering intervention-based approaches in mitigating their effects.

The results of this study also provide important theoretical implications by supporting the perspective that non-pharmacological interventions, such as prenatal gentle yoga, can significantly enhance maternal physiological preparedness for childbirth and reduce the risk of obstetric complications. From a theoretical standpoint, these findings are consistent with the biopsychosocial model of maternal health, which emphasizes the interaction between physical, psychological, and behavioral factors in determining pregnancy and childbirth outcomes. Prenatal yoga represents a holistic intervention that simultaneously addresses these dimensions through physical conditioning, breathing regulation, and stress reduction. Physiologically, regular yoga practice during pregnancy has been shown to improve muscle strength, flexibility, and circulation, all of which contribute to better tissue adaptability during labor (Venugopal et al., 2022). Improved pelvic floor function, in particular, is critical for facilitating controlled fetal descent and minimizing excessive strain on perineal tissues.

Psychologically, yoga has been associated with reduced levels of stress, anxiety, and fear of childbirth, which are known to negatively impact labor progression by increasing muscle tension and impairing coordination (Villar-alises et al., 2023). The integration of these physiological and psychological benefits may explain the significant reduction in both incidence and severity of perineal rupture observed in this study. Furthermore, these findings support emerging theories that emphasize the role of maternal self-efficacy and body awareness in improving childbirth outcomes. Women who engage in prenatal yoga may develop greater confidence in their ability to manage labor, leading to more controlled and effective pushing techniques. This aligns with recent evidence suggesting that maternal empowerment and active participation in labor are key determinants of positive birth outcomes (Riawati et al., 2022). By demonstrating that a structured, non-invasive intervention can produce measurable improvements in clinical outcomes, this study contributes to the growing body of literature advocating for the integration of holistic and preventive approaches in maternal healthcare.

The findings highlight the importance of considering modifiable risk factors in obstetric care, suggesting that interventions such as prenatal yoga may reduce perineal trauma and shift the focus from risk identification to risk modification. Integrating prenatal yoga into routine antenatal care may provide a cost-effective strategy, particularly in low-resource settings, while emphasizing the value of early and continuous maternal education. However, these implications should be interpreted cautiously due to the study's quasi-experimental design and small sample size. Further large-scale randomized and multicenter studies are needed to confirm these findings and clarify the mechanisms through which prenatal yoga influences obstetric outcomes.

From a clinical perspective, integrating prenatal gentle yoga into routine antenatal care may serve as a safe, cost-effective, and accessible strategy to reduce perineal trauma. The findings of this study, which demonstrated a significant reduction in both the incidence (40% vs 73.3%; $p=0.048$) and severity ($p=0.021$) of perineal rupture, provide compelling evidence for its practical application in maternal healthcare settings. In particular, the absence of severe perineal rupture (degree III-IV) in the intervention group suggests that prenatal yoga may play a crucial role in preventing more serious obstetric complications. This has direct implications for clinical practice, as severe perineal trauma is associated with long-term morbidity, including pelvic floor dysfunction, anal incontinence, chronic pain, and reduced quality of life (Wakjira et al., 2025). By reducing both the occurrence and severity of such complications, prenatal yoga may contribute to improved postpartum recovery and overall maternal well-being.

Prenatal gentle yoga may reduce perineal trauma by improving pelvic floor flexibility and maternal control during labor, which are associated with better childbirth outcomes (Kuder et al., 2024; Wakjira et al., 2025). Its implementation in antenatal care requires adequate resources, trained healthcare providers, participant adherence, and standardized protocols. The intervention model used in this study (three sessions per week for four weeks) may serve as a practical framework for clinical practice. Integrating prenatal yoga into antenatal classes may also enhance social support and participation,

aligning with World Health Organization recommendations on positive pregnancy experiences and preventive maternal care.

In addition to its clinical benefits, prenatal yoga may reduce healthcare costs by decreasing the incidence of perineal trauma, postpartum complications, hospital stays, and follow-up care, particularly in resource-limited settings. These findings support its potential value as a cost-effective maternal health intervention. The present study provides several novel contributions to the existing literature. First, unlike most previous studies that focused predominantly on maternal psychological well-being, labor pain, or labor duration, this study specifically evaluated clinically relevant obstetric outcomes by examining both the incidence and severity of perineal rupture. Second, the findings demonstrate that structured prenatal gentle yoga may substantially reduce the occurrence of perineal trauma, with an estimated 72% reduction in risk after adjustment for potential confounding variables. Third, this study provides evidence from a primary healthcare setting in Indonesia, where research evaluating prenatal yoga as a preventive strategy for perineal trauma remains very limited. These findings therefore extend current evidence by suggesting that prenatal gentle yoga may function not only as a maternal wellness intervention but also as an effective preventive strategy to improve birth outcomes and reduce obstetric complications.

Compared with previous studies, this research shifts the focus of prenatal yoga from improving maternal comfort and psychological health toward preventing clinically significant obstetric complications. Consequently, the findings offer additional scientific evidence supporting the integration of prenatal gentle yoga into routine antenatal care as an evidence-based preventive strategy rather than merely a complementary wellness program. However, the present study was limited by its small sample size, quasi-experimental design, and single-center setting, which may affect statistical power, causal inference, and generalizability. Therefore, future studies should employ larger samples, randomized controlled trial designs, and longer intervention periods to strengthen the evidence. Further research is also needed to identify the optimal duration, frequency, and intensity of prenatal yoga programs, as well as to examine adherence, participant engagement, and the mechanisms underlying its effects on perineal outcomes. In addition, digital and community-based prenatal yoga programs should be explored to improve accessibility and scalability. Despite its limitations, this study provides preliminary evidence supporting prenatal gentle yoga as a preventive strategy for perineal rupture and contributes to the growing body of evidence advocating its integration into routine antenatal care.

CONCLUSION

This study concludes that prenatal gentle yoga is an effective non-pharmacological intervention in reducing both the incidence and severity of perineal rupture among third-trimester pregnant women undergoing vaginal delivery. The findings demonstrated a significantly lower incidence of perineal rupture in the intervention group (40%) compared to the control group (73.3%), along with a notable reduction in severity, as no

cases of severe rupture (degree III-IV) were observed among participants who practiced prenatal yoga. Statistical analyses, including the Mann-Whitney U test and logistic regression, further confirmed that prenatal yoga significantly decreased the risk of perineal trauma by approximately 72%. These results indicate that prenatal gentle yoga not only enhances maternal physical preparedness but also contributes to better control during labor, thereby minimizing perineal injury. Despite limitations related to sample size and study design, this research provides important evidence supporting the integration of prenatal gentle yoga into routine antenatal care as a safe, cost-effective, and accessible strategy to improve maternal outcomes and reduce childbirth-related complications.

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