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Pregnancy Exercises Prevent Perineal Rupture During Normal Delivery In Independent Midwife Practice

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Abstract
Background: The high rate of perineal rupture remains a complication of childbirth with serious impacts on maternal health, including bleeding, infection, and reproductive dysfunction. Prenatal exercise is known to increase pelvic floor muscle elasticity and is expected to play a role in reducing the risk of perineal rupture. This study aimed to evaluate the relationship between prenatal exercise and the incidence of perineal rupture in women undergoing normal labor.
Methods: This study used a retrospective design with a case-control approach. The population included all mothers who gave birth normally in April–May 2025 at the PMB in Bengkulu City, Indonesia. The study sample consisted of 38 case groups and 38 control groups, using total sampling and random sampling techniques. Data analysis was performed using univariate and bivariate methods using the Chi-Square test.
The study results showed that mothers who did not regularly perform prenatal exercises had a higher risk of perineal rupture compared to mothers who did. Statistical tests demonstrated a significant association between prenatal exercises and perineal rupture ($p < 0.05$), with an odds ratio of 9.022.
Conclusion: These findings confirm that regular participation in prenatal exercise significantly contributes to the prevention of perineal rupture during normal delivery. This study highlights the urgency of promoting prenatal exercise as an integral part of antenatal care to improve the quality of normal delivery. It is recommended that midwives and health workers optimize education and facilitation of prenatal exercise to minimize the risk of perineal rupture and improve maternal safety.
Keywords: *pregnancy exercises, perineal rupture, normal delivery*

1. INTRODUCTION

Maternal health remains a crucial indicator of a nation's development and the quality of its health system. The Maternal Mortality Rate (MMR) not only reflects the availability of health facilities but also reveals disparities in socioeconomic status and access to quality maternal services. Hypertensive disorders in pregnancy such as preeclampsia and eclampsia, postpartum infections, unsafe abortions, and postpartum hemorrhage remain the leading causes of maternal death worldwide (Ministry of Health of the Republic of Indonesia, 2024). In addition to death, maternal morbidity such as perineal rupture during childbirth contributes significantly to the physical, psychological, and social burdens experienced by mothers.

Perineal rupture is one of the most common complications of vaginal delivery. According to the World Health Organization (WHO), there were an estimated 2.7 million cases of perineal rupture worldwide in 2020, and this figure is projected to increase to 6.3 million by 2050. In Indonesia, the 2020 national health report noted that of 3,791 spontaneous vaginal deliveries, 83% of mothers experienced perineal rupture, with 63% requiring suturing. Of these, 42% were associated with episiotomy and 38% were due to spontaneous tears (Ministry of Health of the Republic of Indonesia, 2021). This data confirms that perineal rupture remains a serious challenge to maternal health, both in developing and developed countries.

Perineal rupture is defined as an injury to the birth canal that occurs during labor, either spontaneously or through an episiotomy (Kundarti et al., 2024). The degree of tear can range from first-degree (involving the vaginal mucosa) to fourth-degree (involving the rectal mucosa and anal sphincter) (Supiani, 2024). The incidence of perineal rupture is multifactorial, involving maternal, fetal, and intrapartum factors. Maternal factors include parity, maternal age, perineal rigidity, and excessive pushing. Fetal factors include macrosomia, malpresentation, breech presentation, shoulder dystocia, and congenital abnormalities. Intrapartum factors include delivery assistance techniques, maternal position, perineal support, and the decision to perform an episiotomy (Qomarasari, 2022; Prawirohardjo, 2018).

The impact of perineal rupture extends beyond the acute phase of labor. Mothers with severe tears often experience longer recovery times, pain, postpartum hemorrhage, dyspareunia, and psychological stress. Furthermore, due to its proximity to the anus, the perineal wound is highly susceptible to fecal contamination, potentially leading to infection, even sepsis, or long-term reproductive health problems (Indriyani et al., 2024). Therefore, perineal rupture is a maternal morbidity issue that requires special attention in prevention efforts.

One recommended prevention strategy is prenatal exercise. Prenatal exercise is specifically designed to improve maternal fitness, strengthen abdominal and pelvic floor muscles, and prepare the body for physiological changes and the birthing process. Regular exercise during pregnancy can improve circulation, reduce musculoskeletal discomfort, improve maternal breathing patterns, and increase pelvic floor muscle elasticity, thereby reducing the risk of perineal trauma during childbirth (Fajar Wati et al., 2022). In addition to the physical benefits, prenatal exercise also contributes to maternal psychological health, reducing anxiety, and increasing confidence in facing childbirth (Kasmiati, 2023).

Several studies have demonstrated the protective effect of prenatal exercise on perineal rupture. Sari et al. (2022) reported a significant association between prenatal exercise and a lower risk of perineal tear, with a p-value of 0.001 (<0.05). Afni and Ristica (2021) found that mothers who did not regularly perform prenatal exercise had a 4.46-fold greater risk of perineal rupture than mothers who did. Indriyani et al. (2024) also supported these findings with an Odds Ratio (OR) of 4.455, confirming prenatal exercise as an important protective factor. Similar results were reported by Ardiana et al. (2020) and Zumrotin et al. (2020), who emphasized increased perineal elasticity, improved pushing techniques, and more optimal delivery outcomes in mothers who regularly participated in prenatal exercise.

However, the prevalence of perineal rupture in Indonesia remains relatively high. Local data from Bengkulu City in 2025 showed that the prevalence of perineal rupture in three Independent Midwife Practices (PMB) ranged from 38% to 75%. This is despite the fact that these facilities actively hold prenatal exercise classes, although not all mothers regularly participate. This phenomenon suggests that adherence to prenatal exercise and its relationship to the incidence of perineal rupture require further exploration in the local context.

Based on this background, this study was conducted to analyze the relationship between prenatal exercise and the incidence of perineal rupture in women undergoing normal labor at the PMB in Bengkulu City. The results are expected to provide scientific evidence for midwives and maternal health workers to integrate prenatal exercise more systematically into antenatal care, thereby contributing to safer deliveries and a more positive birthing experience for mothers.

2. METHOD

2.1 Research Design

This research is an observational analytical study with a retrospective approach using a randomized design *case control.* This design was chosen to determine the relationship between prenatal exercise and the incidence of perineal rupture in mothers who gave birth normally.

2.2 Location and Time of Research

The study was conducted at several independent midwife practices in Bengkulu City, Indonesia, that actively provide prenatal exercise and maintain birth registries. Data collection took place between April and June 2025.

2.3 Population and Sample

The population in this study was all mothers who gave birth normally at the PMB in Bengkulu City during the study period. The sample consisted of 76 respondents, consisting of:

- Case group: 38 mothers giving birth with perineal rupture, taken using the technique *total sampling*.
- Control group: 38 mothers giving birth without perineal rupture, taken with a 1:1 ratio using the technique *random sampling*.

2.4 Research Variables

- Independent variable: Pregnancy exercise (categorized as regular and irregular).
- Dependent variable: Incidence of perineal rupture (categorized as present or absent).

- Confounding variables: Maternal age, parity, and infant birth weight.

2.5 Data Collection

Data were collected through medical records, birth registers, and prenatal exercise attendance records at each PMB. A structured checklist was used to ensure uniformity in data collection.

2.6 Data Analysis

Data analysis is done in two stages:

- Univariate analysis was used to describe the distribution of respondent characteristics.
- Bivariate analysis was performed using the Chi-Square test to determine the association between prenatal exercise and perineal rupture, with a significance level set at $p < 0.05$. Odds ratios (OR) with 95% confidence intervals (CI) were calculated to measure the strength of the association.

2.7 Ethical Considerations

This research has obtained ethical approval from the Research Ethics Committee of the Bengkulu Ministry of Health Polytechnic, with No.KEPK.BKL/505/06/2025

3. RESULT AND DISCUSSION

Table 1. Respondent Characteristics

Variables		Rupture		No Rupture	
		F	%	F	%
Age					
-	At risk (<20 or >35 years)	5	13.2	2	5.3
-	No Risk (20-35 years)	33	86.8	36	94.7
Parity					
-	Primipara	20	52.6	12	31.6
-	Multipara and Grande multipara	18	47.4	26	68.4
Baby Birth Weight					
-	At risk (≥3500 gr)	8	21.1	10	26.3
-	Not at risk (<3500 gr)	30	78.9	28	73.7
Total		38	100.0	38	100.0

From Table 1, it can be seen that of the 38 respondents in the case group, the majority (86.8%) were in the non-risk age category, the majority (52.6%) were primiparous, and the majority (78.9%) had babies with non-risk birth weight (<3500 grams). Meanwhile, of the 38 respondents in the control group, the majority (94.7%) were in the non-risk age category, the majority (68.4%) were multiparous, and the majority (73.7%) had babies with non-risk birth weight (<3500 grams).

Table 2. Frequency Distribution of Pregnancy Exercises in PMB Bengkulu City in 2025

Pregnancy exercise	Rupture		No Rupture	
	F	%	F	%
Irregular	28	73.7	9	23.7
Regular	10	26.3	29	76.3
Total	38	100.0	38	100.0

Table 2 shows that of the 38 respondents in the perineal rupture group, the majority (73.7%) reported irregular participation in prenatal exercise. Conversely, of the 38 respondents in the non-rupture group, the majority (76.3%) reported regular participation in prenatal exercise.

Table 3. Relationship between Pregnancy Exercises and Perineal Rupture in Women Giving Birth at the PMB in Bengkulu City in 2025

Pregnancy exercise	Perineal Rupture		Total	*p value*	OR
	Of	No			

	F	%	F	%	F	%		
Irregular	28	73.7	9	23.7	37	48.7	0.00	9.02
Regular	10	26.3	29	76.3	39	76.3		
Total	38	100	38	100	39	100		

Based on Table 3, the results of the Chi-square test (Continuity Correction) show a p-value of 0.00 < 0.05, indicating a significant relationship between prenatal exercise and the incidence of perineal rupture in mothers giving birth at the PMB in Bengkulu City. In addition, the Odds Ratio (OR) value is 9.022, which means that mothers who do not do prenatal exercise regularly have a 9.022 times greater risk of experiencing perineal rupture compared to mothers who do prenatal exercise regularly.

Table 4. Relationship between Respondent Characteristics and Perineal Rupture in Women Giving Birth at the PMB in Bengkulu City in 2025

Characteristics	Perineal Rupture				Total		*p value*
	Of		No				
	F	%	F	%	F	%	
Age							
At risk (<20 or >35 years)	5	13.2	2	5.3	7	9.2	0.428
No Risk (20-35 years)	33	86.8	36	94.7	69	90.8	
Parity							
Primipara	20	52.6	12	31.6	32	42.1	0.103
Multipara and Grande multipara	18	47.4	26	68.4	44	57.9	
Baby Birth Weight							
At risk (≥3500 gr)	8	21.1	10	26.3	18	23.7	0.787
Not at risk (<3500 gr)	30	78.9	28	73.7	58	76.3	
Total	38	100	38	100	76	100	

Based on table 4 above, it can be seen that the results of the Chi-square statistical test (Continuity correction) obtained p> 0.05, meaning there is no relationship between the age, parity and birth weight of the baby and the incidence of perineal rupture.

DISCUSSION

The results showed that most respondents in the case and control groups were in the non-risk age category (20–35 years). This is consistent with Manuaba (2018), who stated that optimal reproductive health occurs in this age range, with a lower risk of obstetric complications such as perineal rupture due to better tissue elasticity. In terms of parity, primiparous mothers were more common in the case group, while multiparous mothers were more common in the control group. According to Saifuddin (2018), primiparous mothers have a higher risk of perineal rupture because their perineal tissue has never been stretched before. Most infant weights were within the normal range (<3500 grams) in both groups, indicating that infant weight was not a major factor influencing the incidence of perineal rupture in this study. This is consistent with Prawirohardjo (2018), who explained that macrosomia increases the risk of perineal rupture due to greater pressure on the birth canal. Because most babies are born with a normal birth weight, other factors such as maternal activity, prenatal exercise, and perineal elasticity are more influential in determining perineal outcomes. Overall, even though respondents were in the low-risk category, perineal ruptures still occurred, highlighting the importance of preventive measures such as prenatal exercise.

This study showed that the majority of mothers in the case group had irregular participation in prenatal exercise, while in the control group, the majority of respondents did prenatal exercise regularly. Prenatal

exercise is recognized as a beneficial prenatal intervention to improve maternal comfort, reduce stress, and increase pelvic floor muscle elasticity (Kasmiati, 2023). Supiani et al. (2023) emphasized that prenatal exercise increases pelvic floor flexibility, which facilitates adaptation to the physiological changes of pregnancy and reduces the likelihood of perineal trauma during labor. Sari et al. (2022) also reported that regular prenatal exercise reduces the risk of perineal rupture by strengthening pelvic muscles and preparing mothers physically and psychologically for labor. Irregular participation in prenatal exercise may be influenced by maternal lack of knowledge, limited access to prenatal exercise facilities, or lack of support from family and health workers. Therefore, it is important to increase awareness and accessibility of prenatal exercise as part of routine antenatal care.

The results of the study showed a significant association between prenatal exercise and perineal rupture, with an odds ratio (OR) of 9.022. This indicates that mothers who do not regularly do prenatal exercise have a 9.022 times greater risk of experiencing perineal rupture compared to mothers who do regularly. This finding is in line with Varney (2018), who emphasized that prenatal exercise improves pelvic muscle tone, supports relaxation during labor, and teaches proper breathing and pushing techniques, all of which contribute to the prevention of perineal trauma.

Marmi (2015) further confirmed that regular prenatal exercise improves pelvic strength and elasticity, making the perineum more adaptable during labor. Dewi et al. (2018) also showed that prenatal exercise helps optimize fetal position, improves blood circulation, and enhances maternal control over contractions, thereby reducing the risk of spontaneous perineal rupture. Similar findings were also reported by Ardiana et al. (2020), Kolifah (2021), and Indriyani et al. (2024), all of whom found a significant correlation between prenatal exercise and a reduced incidence of perineal rupture.

However, perineal ruptures are still found in some mothers who regularly perform prenatal exercises, which can be explained by other factors such as macrosomia, precipitous labor, improper pushing techniques, older maternal age, or naturally lower perineal elasticity (Prawirohardjo, 2018). In contrast, a small proportion of mothers who do not regularly perform prenatal exercises do not experience ruptures, which may be due to protective factors such as good tissue elasticity, optimal birthing positions, or skilled birth assistance. These findings suggest that perineal rupture is multifactorial, with prenatal exercises being one protective element.

Faiqoh (2022) also noted that perineal condition (p=0.005) and pushing technique (p=0.000) were significantly associated with perineal rupture. Uncontrolled pushing and sudden delivery of the fetal head can cause severe, asymmetrical tears extending to the anal sphincter, while a rigid perineum increases the severity of the tear (Kurniawati et al., 2022).

From a practical perspective, midwives play a crucial role in encouraging maternal participation in prenatal exercise. As stipulated in Minister of Health Regulation No. 28/2017 concerning Midwifery Practice, midwives are responsible for providing health education, including guidance on physical activity during pregnancy. Integrating prenatal exercise into routine antenatal care and ensuring qualified facilitators can maximize its benefits for maternal health outcomes.

4. CONCLUSION

Based on the findings and discussion of this study regarding the relationship between pregnancy exercises and perineal rupture in mothers giving birth normally at the Independent Midwife Practice (PMB) in Bengkulu City, several conclusions can be drawn:

1. Of the 38 respondents in the case group, most were in the non-risk age category, primiparous, and had given birth to babies with normal birth weight. In the control group, most were also in the non-risk age category, multiparous, and had given birth to babies with normal birth weight.
2. The majority of respondents in the case group had irregular participation in pregnancy exercises, while the majority of respondents in the control group participated in pregnancy exercises regularly.

Prenatal exercise showed a significant association with the incidence of perineal rupture (p = 0.000; OR = 9.022). Mothers who did not regularly participate in prenatal exercise were more likely to experience perineal rupture compared to mothers who regularly performed prenatal exercise.

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