

Influence Perineal Massage and Breathing Techniques for Reducing Perineal Trauma During Childbirth

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ABSTRACT

Perineal trauma is a common complication in primigravida women during vaginal delivery, causing pain, infection, and psychological distress. This study used a true experimental, posttest-only, control-group design with a population of 62 primigravida women, selected through simple random sampling. The sample comprised an intervention group (n=31) that received treatment and a control group (n=31) that did not. Implemented in Malang Regency in July 2025, the intervention included perineal massage starting from 34 weeks of gestation, performed twice a week for 10 minutes using lubricant, and deep breathing techniques during contractions and pushing. The instruments used in this study included a questionnaire, observation sheet, SOP for perineal examination, and deep breathing techniques. Data were analyzed using the Mann-Whitney U test. The results showed a difference between the intervention group (sum of ranks 270.00) and the control group (81.00), with a p-value of 0.001, indicating a lower incidence of perineal trauma in the intervention group. Perineal massage combined with deep breathing techniques is a safe and effective non-pharmacological approach to reducing perineal trauma in primigravida women during childbirth.

Introduction

Maternal mortality frequently occurs as a result of complications that emerge during pregnancy and continue through the childbirth process. In the situation of perineal rupture, 2.7 million cases occur in new women just giving birth, and as predicted, will reach 6.3 million cases in 2050. Approximately 50% of all perineal ruptures worldwide happen in the Asian region (WHO, 2018). In 2019, there were 207 reported cases of postpartum infections in Indonesia resulting from perineal tears that occurred during labor. Around 75% of women experience perineal tears during childbirth. Of 100,000 births, 1,951 were spontaneous deliveries, with 57% requiring perineal suturing, 8% from episiotomy, and 29% from spontaneous lacerations. (Ministry of Health of the Republic of Indonesia, 2019). In the same year, about 26% of mothers who gave birth in East Java Province experienced perineal lacerations (Baljon et al., 2020).

Perineal trauma can lead to pain, severe infections, and psychological disturbances during the postpartum period (Cabral et al., 2022). Non-pharmacological prevention efforts are crucial in minimizing the occurrence of such trauma. One effective method is perineal massage, a gentle technique

applied to the perineal area to enhance tissue elasticity, improve blood circulation, and reduce the risk of tearing during childbirth (Álvarez-González et al., 2022). Other studies have also indicated that perineal massage performed by healthcare professionals yields more significant outcomes compared to self-administered massage (Rodrigues et al., 2023).

Perineal massage is a method that involves gently massaging the area located between the bottom of the vaginal opening and the anus (Dwan et al., 2024). It is typically performed during pregnancy or within the 14 days leading up to childbirth, aiming to soften the connective tissues, improve blood circulation, and enhance the elasticity of the perineal region (Nurhamida Fithri & Simamora, 2022). Perineal massage, when performed during pregnancy and the second stage of labor, helps enhance blood circulation, improve tissue elasticity, and relax the pelvic muscles, which can contribute to a shorter labor. However, it is not recommended for mothers with vaginal infections like vaginitis or herpes, as it may worsen their condition (Romina et al., 2020).

Perineal massage effectively reduces postpartum perineal pain, the severity of perineal tears, and the need for episiotomy, especially when performed by healthcare professionals. It is particularly recommended for primigravidae, whose perineal tissues are less flexible. The massage can be started in the third trimester, ideally from the 34th week, done twice a week using a water-based lubricant, and is most effective when performed regularly by a midwife.

In addition to massage, breathing techniques serve as effective relaxation methods during labor by reducing stress hormones, increasing oxygen intake, and triggering endorphin release to ease pain and anxiety (Kaple & Patil, 2023). Proven breathing techniques can shorten the duration of stage II and reduce perineal tears. Breathing exercises can reduce pain during birth and help the patient feel calmer. This is caused by breathing on the help body, which releases natural opioids, such as enkephalins and endorphins (Issac et al., 2023). The brain blocks pain signals and supports the release of endorphins, which function similarly to morphine. In various states, method relaxation is beneficial; for example, when the body feels sick, is anxious, has less sleep, experiences stress, or is currently feeling emotional (Epe et al., 2021).

Breathing techniques can help mothers manage breathing effectively, reducing the frequency to 60-70 breaths per minute. This improved developmental level elevates blood oxygen levels and lowers pH, ultimately contributing to better overall health and well-being (Issac et al., 2023). Breathing exercises can stimulate the parasympathetic nervous system. Breathing exercises during labor involve deep inhalations and exhalations, which can help lower the heart rate and promote relaxation. This process stimulates the nerves, leading to increased oxygen levels in the blood and triggering the release of endorphins (Heim & Makuch, 2023)

Studies have previously shown that perineal massage can lower the level of severity of perineal tears as well as reduce the use of tools to help at-risk women, causing perineal trauma during the birth process. (Álvarez-González et al., 2022). According to research by Yudianti I (2022), perineal massage is an effective method for reducing the incidence of perineal injuries. Moreover, according to the studies reviewed, there is no indication that perineal massage leads to any adverse effects or harm (Yudianti et

al., 2022). Based on the results of previous studies, the method of breathing with a blow is a positive alternative to pressing the perineal wounds in mothers who are about to give birth. Nevertheless, the successful application of exercises during labor is frequently hindered by limited time, insufficient knowledge, and a lack of adequately trained staff (Leutenegger et al., 2022).

This study aims to explore the combined effect of perineal massage and breathing techniques in reducing perineal trauma during childbirth, an area that has not been extensively studied. Conducted in Malang Regency, the research seeks to offer new insights and contribute meaningfully to midwifery care practices. This study, however, suggests that perineal massage and deep breathing techniques can be interventions to prevent perineal trauma in primigravida, which have previously been studied separately. The study used a true experimental posttest-only control group design, providing higher evidence strength than previous studies, which generally used quasi-experimental designs. This study assessed intact perineum as the primary indicator, rather than rupture severity or the need for an episiotomy. This study was conducted in an independent midwifery practice (TPMB), providing a novel context and practical relevance to community midwifery services.

Methods

This study employed a true experimental design with a posttest-only control group. This design uses an experimental and a control group to measure the treatment effect by comparing the two groups. The study population consisted of primigravida pregnant women in the third trimester, at 34-36 weeks of gestation. A total of 62 participants were sampled using simple random sampling, divided into a control group (31 participants) and an intervention group (31 participants). This study was conducted in Malang Regency.

The intervention group consisted of primigravida pregnant women who received perineal massage starting at 34 weeks of gestation and breathing technique training during labor. Meanwhile, the control group received only standard breathing techniques without perineal massage. This division into two groups was conducted to compare the effect of perineal massage and breathing techniques in preventing perineal trauma during labor. The instruments used in this study included a questionnaire, a partograph observation sheet, and a checklist/SOP for perineal massage and breathing techniques.

In this research, normality was tested using the Shapiro-Wilk Test, and homogeneity was tested using Levene's Test. Moreover, to compare two groups, use the Mann-Whitney U test and limit the significance to $p < 0.05$. This study has received ethical approval from the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health, Malang, with the approval number DP.04.03/F.XXI.30/00674/2025, and all participants provided written informed consent after being fully informed of the research objectives and procedures.

Results

In this study, 62 pregnant women in the third trimester, with gestational ages ranging from 34 to 36 weeks, were divided into two groups: the intervention group (31 participants) and the control group (31 participants).

Table 1. Baseline Characteristics of Participants

Characteristics	Intervention (N=31)		Control (N=31)		P- Value
	f/M	%	f/M	%	
Education					0.224 ^a
Low	13	42	9	29	
Intermediate	16	51.6	20	64.5	
Tall	2	6.4	2	6.5	
Work					0.156 ^a
Housewife	18	58	27	87	
Private	11	13	4	35.5	
Teacher	2	6.5	0	0	
Age	25.55		23.90		0.161 ^a
Weight	63.35		64.45		0.129 ^a
Height	150.50		153.55		0.225 ^a

Table 1 shows that most mothers had secondary education, worked as housewives, were aged 20–30 years, weighed 58–69 kg, and were approximately 150–155 cm tall. Overall, these characteristics indicate that both groups were homogeneous ($p > 0.05$). This shows that both groups had similar baseline characteristics, allowing for a fair comparison of the intervention's effects on perineal trauma.

Table 2. Distribution Frequency and Differences of Perineal Trauma at TPMB Malang Regency in July 2025

Characteristics Perineal Trauma	Group Intervention (n=31)				Group Control (n=31)				P-value
	f	Mean Rank	Sum of Rank	%	f	Mean Rank	Sum of Rank	%	
Rupture	11	18.50	203.50	35%	25	18.50	462.50	81%	0.001
Intact	20	13.50	270.00	65%	6	13.50	81.00	19%	
Total	31	-	-	100%	31	-	-	100%	

Based on Table 2. In the intervention group, 65% of participants had an intact perineum during childbirth, while 35% sustained perineal lacerations to some extent. In contrast, 81% of the control group experienced perineal rupture, with only 19% having an intact perineum. This suggests that combining perineal massage with breathing techniques is more effective in preventing perineal trauma than using breathing techniques alone.

Based on the Mann-Whitney test results, there was a significant difference between the intervention and control groups. In the "rupture" category, both groups had the same average score, 18.50. However, in the "intact perineum" category, the intervention group had a total score of 270.00 compared to the control group (81.00). This means the intervention group had a higher intact perineum score than the control group. The p-value obtained was 0.001 ($p < 0.05$), indicating a statistically significant difference between the two groups. These results suggest that mothers in the intervention group who received perineal massage and deep breathing techniques were more likely to have an intact perineum than those in the control group, which received only deep breathing techniques.

Discussion

The results showed that perineal massage and breathing techniques were effective in reducing perineal trauma during labor. In the intervention group, 65% of mothers gave birth with an intact perineum, while only 35% experienced perineal rupture. In contrast, in the control group using only deep breathing techniques, 81% of mothers experienced perineal rupture, while only 19% maintained an intact perineum. These findings suggest that both interventions yielded superior outcomes compared to deep breathing techniques alone. The Mann-Whitney statistical test also supported this difference, with a p-value of 0.001 ($p < 0.05$), indicating that the difference between the two groups was statistically significant. Furthermore, in the intact perineum category, the intervention group achieved a total score of 270.00, significantly higher than the control group's score of 81.00. Overall, this study demonstrates that perineal massage combined with deep breathing techniques substantially reduces the rate of perineal trauma during labor.

In the intervention group, 51% had secondary education, 42% had low education, and 6.4% had pursued higher education. Similarly, in the control group, 64.5% had completed secondary education, 29% had low education, and only 6.5% had attained higher education. The p-value of 0.224 indicates that there is no significant difference in education level between the intervention and control groups. This means that the mothers' educational levels in both groups were relatively homogeneous, so the education variable did not influence the study's primary outcome, which examined the effects of perineal massage and deep breathing techniques on perineal trauma. According to researchers, maternal education levels affect the understanding and implementation of interventions such as perineal massage and breathing techniques. Mothers with higher education tend to be more receptive to information and more likely to follow instructions, making the intervention more effective. Therefore, maternal education likely contributed to the intervention's success in reducing perineal trauma in this study (Azzahra & Irawan, 2023).

Regarding occupation, the majority of respondents in the intervention group were housewives (58%), while those in the control group were housewives (87%). The proportion of employed individuals was higher in the intervention group (35.5%) than in the control group (13%), and a small proportion of teachers (6.5%) was found exclusively in the intervention group. A p-value of 0.156 for the occupation variable indicates that there is no significant difference between the intervention and control groups. Because the value ($p > 0.05$), it can be concluded that both groups have homogeneous job characteristics. According to the researchers, although there was no significant difference in occupation, the type of work can still influence the time and attention mothers devote to perineal massage and breathing techniques. However, because the distribution of work between the two groups was pretty equal, this factor is not considered to have a significant impact on the intervention's outcomes for perineal trauma (Prameswari et al., 2023).

The control group had an average age of 23.90 years, while the intervention group had an average age of 25.55 years. Maternal age influences the risk of perineal rupture due to changes in tissue elasticity. At a young age, the perineum is immature and therefore more prone to tearing. At age 35 and over,

tissue elasticity decreases, making the perineum stiffer. Both conditions increase the risk of tearing during childbirth (WHO, 2018). The control group had a slightly higher average weight (64.45 kg) than the intervention group (63.35 kg). BMI influences the risk of perineal rupture by altering tissue elasticity and resilience. Mothers with a low BMI tend to have less protected perineal tissue, making it more prone to tearing. At the same time, a high BMI can cause the tissue to become stiffer and increase the likelihood of giving birth to a large baby, which puts more pressure on the perineum. Both of these conditions can increase the risk of perineal rupture during labor (WHO, 2018). The control group had an average height of 153.55 cm, while the intervention group averaged 150.5 cm with unusually high variability. Height reflects skeletal development and is used in calculating BMI. Nevertheless, the variations in age, weight, and height between the two groups were not statistically meaningful.

The study revealed that 65% of participants in the intervention group maintained an intact perineum, demonstrating that the combination of perineal massage and deep breathing techniques effectively reduces the risk of perineal injury. These cost-effective and simple methods are beneficial for midwifery care. They are recommended for inclusion in prenatal education, especially for first-time mothers, to improve their physical and emotional preparedness for childbirth.

According to researchers, perineal massage is a viable non-pharmacological method for preventing perineal trauma. By massaging the area between the vagina and anus, the authors believe this technique can increase tissue elasticity, improve blood flow, and help relax the pelvic floor muscles (Dwan et al., 2024). This more flexible tissue is thought to help the perineum adapt as the baby's head passes through the birth canal, thereby reducing the risk of spontaneous tearing or the need for an episiotomy (Álvarez-González et al., 2022). The author also believes that deep breathing techniques play a crucial role during labor. Proper breathing is supposed to reduce tension, increase oxygen supply, and help mothers control the pressure during pushing. These effects are believed to contribute to a calmer and more controlled labor process (Azizah & Dessy, 2021). Therefore, it can be concluded that perineal massage and deep breathing techniques are two simple interventions that have the potential to help prevent perineal trauma.

Perineal massage and deep breathing techniques are simple interventions beneficial for primigravida women at higher risk of perineal trauma. While both offer physical and psychological benefits, the study shows that deep breathing alone is less effective; 81% of the control group experienced perineal tears, highlighting the need for combined interventions. In this study, breathing techniques are viewed not merely as a means of relaxation, but as essential skills that every pregnant woman should master in preparation for labor. These techniques should be introduced and practiced beginning in the third trimester, ideally through childbirth preparation classes, rather than being taught only during labor.

Deep breathing techniques physiologically activate the parasympathetic nervous system, leading to the release of endorphins, natural pain-relieving hormones that help decrease pain perception and enhance comfort during contractions. Additionally, this technique helps regulate intra-abdominal

pressure during pushing, reducing tension in the pelvic floor muscles and lowering the likelihood of perineal tears (Azizah & Dessy, 2021).

Breathing techniques help reduce pressure and straining during pushing, relax perineal muscles, and lower the risk of perineal tears. They also decrease intra-abdominal pressure and friction, while enhancing oxygen intake, releasing endorphins, and reducing stress, contributing to smoother labor (Addis, Abraham, Getnet, Bishaw, & Mengistu, 2024). These findings indicate that deep breathing techniques should remain an integral part of childbirth education and support programs, given their psychological and physiological benefits for mothers. However, to achieve optimal results in preventing perineal rupture, this intervention should be combined with perineal massage, which increases tissue elasticity.

The results showed a clear difference between the intervention and control groups. In the intervention group, which received perineal massage and deep breathing techniques, the majority of mothers (65%) successfully delivered with an intact perineum; meanwhile, in the control group, which only used deep breathing techniques, 81% experienced perineal tears. With a p-value of 0.001, these results strongly indicate that the combination of perineal massage and deep breathing is more effective in preventing perineal trauma. The benefits of each technique can explain the gap between the two groups. Perineal massage helps increase the elasticity of the perineal tissue, making it more prepared for childbirth. Meanwhile, deep breathing helps mothers control their pushing, allowing them to apply more controlled pressure on the perineum. When these two techniques are combined, they are more effective than using deep breathing alone. Furthermore, baseline variables such as age, education, occupation, weight, and height did not differ significantly between the groups. This means that the two groups were equivalent, suggesting that any differences in outcomes were truly due to the interventions provided. This study can be presented as evidence that the combination of perineal massage and deep breathing is worthy of recommendation as an effective method to reduce the risk of perineal tears during childbirth.

Theoretically, perineal massage can enhance the flexibility of perineal tissues, boost blood flow, and activate nerve endings, thereby improving the body's ability to tolerate pressure during childbirth (Yin et al., 2024). This technique can minimize the risk of high-grade tears and reduce the need for episiotomies. Previous research has shown that antenatal perineal massage effectively reduces the incidence of severe perineal trauma and episiotomies (Romina et al., 2020). Deep breathing techniques help relieve stress and tension during labor. Controlled deep breathing can help mothers feel more relaxed by releasing endorphins, which act as natural pain relievers. Moreover, this method allows mothers to push more efficiently while reducing unnecessary pressure on the perineum. Previous research has shown that deep breathing techniques can reduce perineal tissue damage and shorten the second stage of labor (Heim et al., 2023).

Findings: This study investigated whether the combined intervention of perineal massage and deep breathing techniques proved more effective than deep breathing techniques alone (Okeahialam, Sultan, & Thakar, 2024). The combination of perineal massage and deep breathing techniques not only physically prepared the body's tissues but also provided a sense of calm and control during labor.

Therefore, the researchers advocate routine integration of both techniques into antenatal care, with particular emphasis on primigravidae (first-time mothers).

This study has several limitations, including inconsistent application frequency of perineal massage and varying levels of maternal ability to perform deep-breathing techniques. The study also overlooked other potential factors that could affect perineal trauma, such as the mother's birthing position or the baby's birth weight. Nevertheless, its strength lies in its use of an intervention that is still infrequently explored and studied, simple, safe, and cost-effective non-pharmacological interventions, such as perineal massage and deep breathing, providing valuable scientific contributions to obstetric care.

Conclusions

Perineal massage and breathing techniques have been shown to minimize perineal trauma during childbirth in first-time mothers effectively. These interventions enhance the elasticity of perineal tissues, facilitate the birthing process, and reduce the risk of perineal tears, especially second-degree lacerations. Analysis results show that the majority of respondents in the group intervention maintain an intact perineum, whereas in the group control, which uses only the breathing technique, the majority experience perineal rupture. There is a significant difference between the two groups, with the intervention group maintaining perineal integrity more effectively than the control group.

Recommended for pregnant mothers, especially primigravida, to carry out perineal massage from 34 weeks pregnant and apply breathing technique during labor to reduce the risk of perineal trauma. Healthcare providers are encouraged to provide education and guidance on the second intervention during antenatal care. Future research should involve a larger sample and account for additional factors, such as birthing positions and the techniques used by birth attendants.

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