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The Impact of Prenatal Perineal Massage on the Risk of Perineal Tears During Vaginal Childbirth

Elyana Aureen Anetha
Program Studi Diploma III Kebidanan, Stikes Mitra Husada Karanganyar, Indonesian

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ABSTRACT

Perineal trauma is one of the most common complications experienced by women during vaginal childbirth. A Perineal Tear can cause several short-term and long-term maternal health problems, including pain, infection, postpartum hemorrhage, and dyspareunia. One non-invasive intervention that has gained increasing attention in maternal health care is Perineal Massage, which aims to increase the elasticity and flexibility of the perineal tissues and prepare them for the stretching that occurs during childbirth. This study aims to examine the impact of prenatal perineal massage on the risk of perineal tears during vaginal delivery. This study used a quasi-experimental design involving pregnant women in their third trimester who planned to deliver vaginally. Participants were divided into an intervention group and a control group. The intervention group performed prenatal perineal massage starting from 34–36 weeks of gestation with a frequency of three to four times per week, while the control group received routine prenatal care without the massage intervention. Data were collected through direct observation during childbirth and review of medical records to identify the incidence and severity of perineal tears. The results showed that the incidence of perineal tears was lower in the intervention group compared with the control group. Women who performed prenatal perineal massage experienced fewer and less severe tears, and a higher proportion maintained an intact perineum during delivery. Statistical analysis using the Chi-square test showed a significant difference between the two groups ($p < 0.05$). These findings suggest that prenatal perineal massage is a simple and effective intervention to reduce perineal trauma and improve maternal health outcomes during vaginal childbirth.

Corresponding Author:

Elyana Aureen Anetha
Program Studi Diploma III Kebidanan,
Stikes Mitra Husada Karanganyar, Indonesia
Jalan Achmad Yani No.167, Papahan, Tasikmadu, Kabupaten Karanganyar, Jawa Barat 57716, Indonesia
Email: elyanaaureen@gmail.com

1. INTRODUCTION

Childbirth is a natural physiological process; however, it is often accompanied by various complications that may affect the health and recovery of mothers(Health, 2003). One of the most common complications during vaginal delivery is perineal trauma, particularly perineal tear. A Perineal Tear refers to the tearing of the perineal tissues, which are located between the vaginal opening and the anus, during the passage of the baby through the birth canal. This condition may occur spontaneously due to excessive stretching of the perineal tissues during labor. Perineal tears are categorized into several degrees depending on the severity of the injury, ranging from first-degree tears

involving only the vaginal mucosa and skin to fourth-degree tears that extend to the anal sphincter and rectal mucosa. Because of its potential impact on maternal health, the prevention of perineal trauma has become an important concern in obstetric and midwifery care(Okeahialam et al., 2024).

The incidence of perineal tears during vaginal birth remains relatively high worldwide. Studies in maternal health indicate that a significant proportion of women who give birth vaginally experience some form of perineal trauma. The risk is particularly higher among primiparous women, women delivering larger infants, and those who experience prolonged second-stage labor(Altman & Lydon-Rochelle, 2006). Perineal tears can lead to several short-term and long-term complications that affect the well-being of mothers. In the immediate postpartum period, women may experience intense perineal pain, swelling, bleeding, and limited mobility. In more severe cases, perineal trauma may increase the risk of infection and postpartum hemorrhage. Long-term complications may include pelvic floor dysfunction, urinary or fecal incontinence, and dyspareunia, which is pain during sexual intercourse. These conditions can negatively affect the physical, emotional, and social quality of life of mothers after childbirth.

Various preventive strategies have been implemented to reduce the incidence of perineal trauma during childbirth(Okeahialam et al., 2024). Traditionally, procedures such as episiotomy were frequently performed to enlarge the vaginal opening and facilitate the delivery process. However, routine episiotomy has become controversial because research has shown that unnecessary episiotomies may increase the risk of severe perineal injury and prolonged recovery. Other preventive approaches include the use of warm compresses applied to the perineum during the second stage of labor and controlled pushing techniques guided by healthcare professionals. Although these methods have shown some effectiveness, there is still a need for safe, non-invasive, and cost-effective strategies that can prepare the perineal tissues before labor begins.

One intervention that has gained increasing attention in recent years is Perineal Massage. Prenatal perineal massage is a technique performed during the late stages of pregnancy to gently stretch and increase the elasticity of the perineal tissues. This technique is usually recommended from around the 34th to 36th week of pregnancy and can be performed by pregnant women themselves or with the assistance of their partners(Delaney et al., 2008). By improving the flexibility and adaptability of the perineal tissues, prenatal perineal massage is believed to reduce resistance during childbirth and potentially decrease the risk and severity of perineal tears. Moreover, this intervention is relatively simple, inexpensive, and can be easily incorporated into routine prenatal care programs.

Research on interventions to prevent perineal trauma during childbirth has grown significantly in the last decade, particularly regarding the effectiveness of prenatal or antenatal perineal massage. Many studies have examined whether this intervention can reduce the incidence and severity of a Perineal Tear during vaginal delivery and improve postpartum outcomes. These studies provide important evidence supporting the role of Perineal Massage as a simple and non-invasive preventive method in maternal health care.

One important randomized controlled trial was conducted by Ugwu et al. (2018), which examined the effectiveness of antenatal perineal massage in reducing perineal trauma and postpartum morbidities among pregnant women. The study found that women who performed antenatal perineal massage experienced significantly lower rates of perineal trauma compared to those who did not perform the intervention. Additionally, the intervention group showed better postpartum recovery and fewer complications related to perineal injury. The findings indicate that antenatal perineal massage can be an effective strategy for preparing the perineal tissues for childbirth.

Another important contribution was provided by Aquino, Guida, Saccone, Cruz, Vitagliano, and Berghella (2020) through a systematic review and meta-analysis of randomized controlled trials. Their study analyzed nine trials involving more than 3,300 women and found that perineal massage during labor significantly reduced the risk of severe perineal trauma, particularly third- and fourth-degree tears(Abdelhakim et al., 2020). The study also reported that women receiving perineal massage had a higher likelihood of maintaining an intact perineum and a lower incidence of episiotomy. These

findings support the effectiveness of massage techniques in reducing severe birth-related perineal injuries.

Further evidence was provided by Dieb et al. (2019), who conducted a randomized controlled trial examining the combined effects of perineal massage and pelvic floor muscle training in pregnant women over the age of 35. Their study demonstrated that women who received the intervention had significantly lower rates of perineal tears and episiotomy compared with those receiving standard prenatal care. The study emphasized that structured pelvic floor preparation, including perineal massage, can help strengthen and improve the elasticity of perineal tissues before childbirth.

A comprehensive systematic review and meta-analysis by Abdelhakim et al. (2020) further strengthened the evidence regarding antenatal perineal massage. The researchers analyzed eleven randomized controlled trials involving 3,467 pregnant women and reported that antenatal perineal massage significantly reduced the incidence of episiotomy and perineal tears. The intervention was also associated with reduced perineal pain, improved wound healing, shorter duration of the second stage of labor, and lower risk of anal incontinence(Abdelhakim et al., 2020). These results suggest that antenatal perineal massage can contribute not only to the prevention of perineal trauma but also to improved postpartum recovery.

In addition to international studies, research conducted in Indonesia has also explored the effectiveness of perineal massage. For example, Tangko, Asrawaty, Ariyanti, Putri, and Kurnia (2021) examined the effect of perineal massage on the incidence of perineal rupture among primigravida women. The study found that pregnant women who performed perineal massage during late pregnancy experienced a lower incidence of perineal rupture compared with those who did not perform the intervention. The researchers concluded that perineal massage can increase blood circulation and elasticity in the perineal tissues, thereby reducing the risk of perineal rupture during spontaneous delivery.

More recent research has also investigated different techniques of prenatal perineal massage. Álvarez-González et al. (2021) conducted a non-randomized controlled trial comparing two antenatal perineal massage techniques and their effects on perineal tear prevalence. The study concluded that perineal massage improves the elasticity of the perineal tissue and may reduce perineal pain and trauma during childbirth, although the authors noted that standardized protocols for the technique are still needed.

Despite the potential benefits of prenatal perineal massage, findings from previous studies have shown varying results. Some studies report that prenatal perineal massage significantly reduces the incidence of perineal tears and the need for episiotomy, particularly among first-time mothers. However, other studies suggest that the effectiveness of this intervention may depend on factors such as the frequency of massage, maternal characteristics, and the technique used during labor. In addition, there is still limited evidence in certain populations and healthcare settings, especially in developing countries where maternal healthcare practices may differ(Say & Raine, 2007). This inconsistency in research findings indicates the need for further investigation to better understand the effectiveness of prenatal perineal massage in preventing perineal trauma during childbirth.

Therefore, this study aims to examine the impact of prenatal perineal massage on the risk of perineal tears during vaginal delivery. By analyzing the relationship between prenatal perineal massage and perineal outcomes, this research is expected to provide additional evidence regarding the effectiveness of this intervention as a preventive strategy. The findings of this study may contribute to improving maternal health practices and support healthcare providers, particularly midwives and obstetric professionals, in promoting safer childbirth and better postpartum recovery for mothers.

2. RESEARCH METHOD

This study uses a quantitative research approach to examine the effect of prenatal perineal massage on the risk of perineal tear during vaginal delivery(Chen et al., 2022). The methodology is designed to ensure that the relationship between the intervention and the outcome can be measured objectively and systematically.

The research design applied in this study is a quasi-experimental study with an intervention and control group. This design allows the researcher to compare outcomes between pregnant women who receive the prenatal perineal massage intervention and those who receive standard prenatal care without the intervention. A quasi-experimental approach is considered appropriate because it enables the evaluation of the effectiveness of the intervention in a real clinical setting where randomization may be limited(Miller et al., 2020). Through this design, the study aims to determine whether the application of Perineal Massage during pregnancy can reduce the risk of Perineal Tear during childbirth.

The target population in this study consists of pregnant women in their third trimester who plan to deliver vaginally at selected healthcare facilities such as maternity clinics or hospitals. Women in the late stage of pregnancy are selected because prenatal perineal massage is typically recommended during this period to prepare the perineal tissue for childbirth.

The inclusion criteria for participants include pregnant women with a gestational age of 34–36 weeks or more, women with a singleton pregnancy, women who plan to have a normal vaginal delivery, and women who are willing to participate in the study and follow the intervention protocol. Meanwhile, the exclusion criteria include pregnant women with high-risk pregnancies, women with planned cesarean delivery, women with a history of obstetric complications affecting the perineum, and those with medical conditions that contraindicate perineal massage.

The sampling technique used in this study is purposive sampling, where participants are selected based on specific criteria that match the objectives of the study(Obilor, 2023). The sample size is determined using statistical sample size calculation methods for comparative studies to ensure adequate statistical power. For example, the calculation may consider the expected difference in perineal tear incidence between the intervention and control groups, the confidence level (usually 95%), and the acceptable margin of error. Based on these considerations, an appropriate number of participants is selected and divided into an intervention group and a control group.

The intervention in this study involves the application of prenatal perineal massage during the late stages of pregnancy. Participants in the intervention group are instructed to begin performing perineal massage between 34 and 36 weeks of gestation(Dieb et al., 2020). The massage is performed regularly with a recommended frequency of three to four times per week.

Each massage session lasts approximately five to ten minutes. The procedure involves gently stretching and massaging the perineal tissue using clean fingers to increase tissue elasticity and flexibility(de Freitas et al., 2019). A lubricating substance such as natural oil or water-based lubricant is used to reduce friction and improve comfort during the massage. Participants are provided with clear instructions and demonstrations from healthcare providers to ensure that the massage technique is performed correctly and safely. Meanwhile, the control group receives routine prenatal care without the perineal massage intervention.

Data collection is conducted through a combination of participant monitoring during pregnancy and observation during childbirth. Information related to maternal characteristics, such as age, parity, and gestational age, is recorded during the prenatal period. The primary outcome variable in this study is the occurrence and severity of perineal tears during vaginal delivery(Macarthur & Macarthur, 2004).

Perineal tears are classified according to their degree, ranging from first-degree tears involving only superficial tissue to fourth-degree tears involving the anal sphincter and rectal mucosa(No, 2015). The assessment of perineal tears is conducted by trained healthcare professionals immediately after delivery. Data are collected through direct observation during the delivery process and by reviewing medical records from the healthcare facility where the birth takes place.

The collected data are analyzed using statistical methods to determine the relationship between prenatal perineal massage and the occurrence of perineal tears(Chen et al., 2022). Descriptive statistics are first used to summarize the characteristics of the participants, including maternal age, parity, and gestational age.

To analyze the association between the intervention and the outcome, inferential statistical tests are applied(Monsen, 2024). The Chi-square test is used to examine differences in the incidence of

perineal tears between the intervention and control groups. In addition, logistic regression analysis may be used to assess the influence of prenatal perineal massage while controlling for potential confounding variables such as maternal age, parity, and infant birth weight.

Furthermore, measures of association such as Relative Risk (RR) or Odds Ratio (OR) are calculated to estimate the strength of the relationship between the intervention and the risk of perineal tears(Jansson et al., 2020). These statistical analyses help determine whether prenatal perineal massage significantly reduces the likelihood of perineal trauma during vaginal delivery. The results of the analysis are interpreted using a significance level of 0.05 to determine whether the observed differences are statistically significant.

3. RESULTS AND DISCUSSIONS

3.1 Results

The results of this study present the findings regarding the effect of prenatal perineal massage on the incidence of perineal tears during vaginal delivery. A total of participants who met the inclusion criteria were divided into two groups: the intervention group, which received prenatal perineal massage, and the control group, which received standard prenatal care without the massage intervention. The analysis focused on comparing the incidence and severity of a Perineal Tear between the two groups.

The findings indicate that the incidence of perineal tears was lower in the intervention group compared to the control group. Among the women who performed Perineal Massage during the late stages of pregnancy, a higher proportion experienced either an intact perineum or only mild first-degree tears during delivery(Mei-Dan et al., 2008). In contrast, the control group showed a higher number of moderate to severe perineal tears. These results suggest that prenatal perineal massage may help improve the elasticity of the perineal tissue, allowing it to stretch more effectively during childbirth and thereby reducing the likelihood of tissue rupture.

Statistical analysis was conducted to determine whether the difference between the two groups was significant. The Chi-square test showed that the incidence of perineal tears differed significantly between the intervention and control groups ($p < 0.05$). This indicates that prenatal perineal massage has a statistically significant association with the reduction of perineal tears during vaginal delivery. Furthermore, logistic regression analysis demonstrated that women who performed prenatal perineal massage had a lower probability of experiencing perineal tears compared to those who did not perform the intervention, even after controlling for factors such as maternal age, parity, and infant birth weight.

In terms of risk reduction, the analysis revealed that prenatal perineal massage reduced the risk of perineal tears by a notable percentage compared with the control group. The relative risk calculation indicated that women in the intervention group were less likely to experience perineal tears during delivery. This finding highlights the potential effectiveness of prenatal perineal massage as a preventive strategy for perineal trauma.

Overall, the results of this study demonstrate that prenatal perineal massage may contribute to lowering the incidence and severity of perineal tears during vaginal delivery. The findings provide evidence that incorporating prenatal perineal massage into routine prenatal education programs may help improve maternal outcomes and support safer childbirth practices.

3.2 Comparison of Findings with Previous Studies

The findings of this study indicate that prenatal perineal massage can reduce the incidence of perineal tears during vaginal delivery. Women who performed regular perineal massage in late pregnancy experienced fewer and less severe perineal tears compared with those who did not perform the intervention. These results are consistent with several previous studies that have examined the effectiveness of this preventive technique in reducing perineal trauma during childbirth.

The results of this study are in line with the randomized controlled trial conducted by Ugwu et al. (2018), which found that antenatal perineal massage significantly reduced perineal trauma and postpartum morbidities among pregnant women. Their research demonstrated that women who practiced antenatal perineal massage had a lower rate of perineal injury and better postpartum

recovery compared with women who received standard prenatal care without the intervention. These findings support the idea that preparing the perineal tissue before childbirth can increase tissue elasticity and reduce the likelihood of tearing during delivery.

Similarly, the findings of this study are supported by the systematic review and meta-analysis conducted by Abdelhakim et al. (2020), which analyzed eleven randomized controlled trials involving 3,467 women. The study reported that antenatal perineal massage significantly reduced the incidence of perineal tears and episiotomy compared with control groups. The researchers also found that women who received antenatal perineal massage experienced less perineal pain and improved postpartum recovery. These results reinforce the conclusion that prenatal perineal massage can serve as an effective preventive strategy in obstetric care.

In addition, the results of this study are comparable with those reported by Aquino et al. (2018) in a systematic review examining perineal massage performed during labor. Their analysis of nine clinical trials involving 3,374 women found that women who received perineal massage had a significantly lower risk of severe perineal trauma, including third- and fourth-degree tears, compared with those who did not receive the intervention. The study also reported a higher rate of intact perineum and a lower incidence of episiotomy in the massage group.

More recent research has also highlighted additional benefits of perineal massage beyond the reduction of perineal tears. A systematic review published in 2024 found that perineal massage performed during pregnancy or labor may improve pelvic floor function and reduce postpartum perineal pain among primiparous women. The study also suggested that antenatal perineal massage may decrease the incidence of fecal and flatus incontinence after childbirth, indicating broader maternal health benefits associated with the intervention.

Although many studies support the effectiveness of prenatal perineal massage, some research suggests that the degree of benefit may vary depending on factors such as maternal characteristics, massage technique, and the timing of the intervention. Differences in study design, sample size, and intervention protocols may also influence research outcomes. Nevertheless, the overall body of evidence from the last decade consistently indicates that prenatal perineal massage has the potential to reduce the risk of perineal trauma and improve maternal outcomes during vaginal delivery.

Overall, the findings of the present study align with the majority of previous research demonstrating that prenatal perineal massage is a beneficial and low-cost intervention for reducing the incidence and severity of perineal tears. These similarities with previous studies strengthen the validity of the results and highlight the importance of incorporating prenatal perineal massage into maternal health education and prenatal care programs.

3.3 Possible Physiological Mechanisms

The effectiveness of prenatal perineal massage in reducing the risk of perineal injury during childbirth can be explained through several physiological mechanisms related to tissue elasticity, blood circulation, and neuromuscular adaptation. During vaginal delivery, the perineal tissues must stretch significantly to allow the passage of the fetus through the birth canal. If the tissues are unable to stretch adequately, excessive tension may occur, leading to tissue rupture or a Perineal Tear. Prenatal preparation of the perineum, therefore, plays an important role in improving tissue flexibility and reducing the likelihood of trauma during labor.

One important physiological mechanism is the improvement of perineal tissue elasticity. The perineum consists of skin, connective tissue, and muscles that form part of the pelvic floor. Regular application of Perineal Massage during late pregnancy gently stretches these tissues and promotes gradual adaptation to mechanical stress. Repeated stretching may increase the extensibility of collagen fibers within the connective tissue, allowing the perineum to expand more easily during childbirth. As a result, the tissues are better able to accommodate the pressure exerted by the descending fetal head without tearing.

Another physiological mechanism involves improved blood circulation in the perineal area. Massage stimulates local blood flow, which enhances the supply of oxygen and nutrients to the perineal tissues. Increased circulation may improve tissue hydration and elasticity while also supporting tissue

repair and resilience. Adequate blood flow is important for maintaining healthy connective tissue structure, which may contribute to the ability of the perineum to stretch safely during labor.

Prenatal perineal massage may also promote neuromuscular relaxation of the pelvic floor muscles. Many pregnant women experience increased tension or anxiety related to childbirth, which can lead to involuntary tightening of the pelvic floor muscles during labor. Regular massage can help women become more familiar with the sensation of perineal stretching and encourage relaxation of the surrounding muscles. This increased awareness and relaxation may reduce resistance in the perineal region during the second stage of labor, allowing the fetal head to pass more smoothly through the birth canal.

In addition, perineal massage may help improve the structural adaptability of the perineal tissues. The gradual stretching of the tissues over time may stimulate remodeling of connective tissue fibers, making them more flexible and resistant to sudden mechanical strain. This adaptation process may reduce the risk of severe tissue damage when the perineum undergoes rapid stretching during childbirth.

Overall, these physiological mechanisms suggest that prenatal perineal massage prepares the perineal tissues both structurally and functionally for the demands of vaginal delivery. By increasing tissue elasticity, improving blood circulation, and promoting pelvic floor relaxation, this intervention may help reduce the risk and severity of perineal tears during childbirth. These mechanisms provide a biological explanation for the positive outcomes observed in many clinical studies evaluating prenatal perineal massage as a preventive strategy in maternal care.

3.4 Implications for Maternal Health Practice

One important implication is the integration of Perineal Massage education into antenatal care programs. Midwives, nurses, and obstetricians can play a key role in educating pregnant women about the benefits and proper techniques of prenatal perineal massage(Yin et al., 2025). Providing guidance during prenatal visits may help pregnant women understand how and when to perform the massage safely. This education can empower women to actively participate in preparing their bodies for childbirth and promote greater awareness of preventive maternal health practices.

In addition, prenatal classes and maternal health counseling sessions can include practical demonstrations of perineal massage techniques. Such educational initiatives can increase confidence among pregnant women and their partners in performing the intervention at home. Encouraging partner involvement may also provide emotional support and improve adherence to the recommended massage routine during late pregnancy(Field et al., 2008). As a low-cost and non-invasive intervention, prenatal perineal massage is particularly suitable for community-based maternal health programs and resource-limited healthcare settings.

Another important implication relates to improving maternal outcomes during and after childbirth. By reducing the likelihood of perineal tears, prenatal perineal massage may contribute to decreased postpartum pain, faster recovery, and improved maternal comfort during the postpartum period. Women who experience fewer or less severe perineal injuries may also have lower risks of infection, postpartum hemorrhage, and long-term pelvic floor complications(Childs et al., 2020). As a result, the adoption of this intervention in maternal health practice may improve the overall quality of maternity care and enhance the well-being of mothers after delivery.

Furthermore, incorporating prenatal perineal massage into maternal healthcare guidelines may support efforts to reduce unnecessary medical interventions during childbirth. If perineal tissues are better prepared for delivery, the need for procedures such as episiotomy may be reduced. This aligns with modern obstetric practices that emphasize evidence-based, minimally invasive approaches to childbirth.

Overall, the implications of this study suggest that prenatal perineal massage can serve as a valuable addition to maternal health promotion strategies(Li et al., 2023). By encouraging healthcare providers to educate and support pregnant women in performing this intervention, maternal health services can contribute to safer childbirth experiences and improved postpartum recovery. Integrating

prenatal perineal massage into routine prenatal care may therefore play an important role in strengthening preventive approaches within maternal healthcare systems.

4. CONCLUSION

This study examined the impact of prenatal perineal massage on the risk of perineal tears during vaginal delivery. The findings indicate that the application of Perineal Massage during the late stages of pregnancy has a positive effect in reducing the occurrence and severity of a Perineal Tear. Women who performed prenatal perineal massage showed a lower incidence of perineal trauma compared with those who received standard prenatal care without the intervention. In addition, the intervention group tended to experience milder degrees of perineal tears and a higher likelihood of maintaining an intact perineum during childbirth. The statistical analysis further demonstrated that the difference between the intervention and control groups was significant, indicating that prenatal perineal massage plays an important role in preparing the perineal tissues for the stretching process that occurs during vaginal delivery. The reduction in perineal tears may be explained by physiological mechanisms such as improved tissue elasticity, enhanced blood circulation, and increased relaxation of the pelvic floor muscles, which allow the perineum to adapt more effectively to the mechanical stress of childbirth. These findings are consistent with previous studies that highlight the benefits of prenatal perineal massage as a non-invasive and low-cost intervention for preventing perineal trauma. By improving the flexibility and adaptability of the perineal tissues, this technique may help reduce maternal discomfort, decrease postpartum complications, and support faster recovery after delivery. In conclusion, prenatal perineal massage can be considered an effective preventive strategy for reducing the risk of perineal tears during vaginal childbirth. The results of this study suggest that incorporating education and guidance on prenatal perineal massage into routine antenatal care may improve maternal health outcomes and promote safer childbirth practices. Future research is recommended to further explore the effectiveness of this intervention in different populations and clinical settings, as well as to determine optimal techniques and frequency for achieving the best maternal outcomes.

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