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# Brithing Position, Second Stage Duration, and Brith weight Associated with Perineal Lacerations

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***ABSTRACT***
***Introduction****: Perinal laceration is a common complication of vaginal delivery. This study aimed to determine the association of birth position, duration of the second stage of labor, and newborn birth weight with perineal laceration..*
***Methods****: A quantitative analytical study with a cross-sectional design was conducted among 45 women who gave birth, selected using purposive sampling. Data were collected using an observation checklist and analyzed using Fisher's exact test with a significance level of 0.05.*
***Results****: Perineal laceration occurred in 68.9% of participants. Significant associations were found between birth position (p=0.003), duration of the second stage of labor (p=0.024), newborn birth weight (p=0.036), and perineal laceration. Laceration occurred in 90.5% of women in the lithotomy position, 100% with a second stage lasting >30 minutes, and 100% with newborn birth weight ≥3500 g.*
***Discussion and Conclution****: Birth position, duration of the second stage of labor, and newborn birth weight were significantly associated with perineal laceration.*

***Keywords****: birthing position, duration of second stage of labor, newborn weight, perineal laceration, vaginal delivery*

## INTRODUCTION

Perineal laceration is a frequently occurring complication that can occur during vaginal delivery.and continues to represent a major contributor to maternal morbidity on a global scale. It has been reported that approximately nine out of ten women sustain a certain degree of perineal trauma following vaginal childbirth. .[1] Perineal trauma may cause discomfort and pain, infection, delayed wound healing, urinary and fecal incontinence, sexual dysfunction, and psychological distress, thereby affecting the well-being and quality of life of women after childbirth.[2] Despite advances in intrapartum care, preventing perineal laceration continues to be a challenge in clinical practice, particularly in primary maternity care settings where the majority of normal vaginal births occur.

Perineal lacerations may arise from the complex interplay of maternal, fetal, and factors related to labor Increased neonatal infant birth weight and an extended laboring period during the second stage, and maternal birthing position have Been dentified as important determinants of perineal trauma [3] advanced age of the mother, prior cesarean delivery, and greater newborn birth weight have also been reported as independent risk factors for perineal laceration [4] . An extended the second phase of childbirth has been linked to a higher risk of severe perineal lacerations [5]. In addition, fetal birth weight greater than 4,000g has been identified as an independent factor associated with the probability of experiencing a second-degree perineal lacerations and Obstetric Anal Sphincter Injury (OASIS).[6].

Maternal birthing position has received considerable attention because different positions may alter pelvic dimensions, fetal descent, and perineal stretching during childbirth. Adopting a nonsupine maternal posture during the second stage of childbirth has been associated with a higher likelihood of an intact perineum and a ower incidence of episiotomy [7] A separate study reported that maternal positioning during the expulsion phase was significantly related to perineal outcomes [8] . A large study conducted at the population level involving approximately 113,000 spontaneous vaginal deliveries reported differences in the risk of Obstetric Anal Sphincter Injury (OASIS) according to maternal birthing position.[9] Furthermore, the upright position has been shown to lower the rate of episiotomy but result in a higher occurrence of first-degree perineal lacerations.[10].

the length of the second phase of childbirth and the newborn’s birth weight.are also recognized as important predictors of perineal aceration. A prolonged the second phase of childbirth is related to an elevated likelihood of perineal laceration.5] Neonatal birth weight greater than

3,500 g has also been reported to increase the risk of perineal laceration.[11] Similarly a study conducted in Indonesia demonstrated a significant association between birth weight and the severity of perineal rupture.[12]

Although previous studies have examined birthing position, an extended the second phase of childbirth and neonatal birth weight as individual factors, evidence evaluating these variables simultaneously in Indonesian primary maternity care remains limited. Most studies have focused on only one determinant or were conducted in hospital settings, making it difficult to understand the combined contribution of these factors to perineal laceration among women giving birth in primary maternity care. Therefore, an important research gap remains regarding the simultaneous evaluation of these risk factors in Indonesian clinical settings.

The distinctive aspect of this study is its simultaneous evaluation of.maternal birthing position, the length of the second phase of childbirth, and neonatal birth weight .in relation to perineal laceration among women delivering in Indonesian primary maternity care. By evaluating these variables within the same study population, this study provides a broader understanding of the determinants of perineal laceration than studies that examined each factor separately.

We hypothesized that maternal birthing position, a prolonged the second phase of childbirth, and higher neonatal birth weight may be associated with the occurrence of perineal lacerations. Based on this hypothesis, the present study was conducted to investigate the relationship of maternal birthing position, the duration of the the second phase of childbirth, and neonatal birth weight with perineal laceration incidence among female participants who underwent vaginal childbirth in primary maternity care facilities in Indonesia.

## METHODS

This study was conducted from May to June 2026 using A cross-sectional correlational analytical design was employed to investigate the association of maternal birthing position, the length of the the second phase of childbirth, and neonatal birth weight with the occurrence of perineal lacerations. . The research was carried out at the.Cililin DTP Community Health Center, Rina Margahayu Independent Midwifery Practice, Nia Rosmawati Independent Midwifery Practice, and Iin Siti Halimah Independent Midwifery Practice. The study population consisted of 50 mothers giving birth. Using Slovin's formula, the required number of samples was calculated with a 5% margin of error, as shown below : $n = N / [1 + N (e^2)]$, resulting in 44.44, which was rounded up to 45 respondents. Sampling was conducted using

a purposive sampling technique based on predetermined criteria. Purposive sampling was employed to recruit participants who fulfilled specific clinical criteria considered relevant to the objectives of the study, including mothers who experienced normal vaginal delivery at term and had complete labor records, thereby ensuring that all participants were appropriate for evaluating the association between the study variables.

Eligible participants included mothers who underwent spontaneous vaginal delivery at a gestational age ranging from 37 to 42 weeks. . Participants were excluded if they .nstrumental delivery using vacuum extraction or forceps and mothers with birth canal abnormalities. Information was gathered using a structured observation instrument based on labor documentation, including maternal birthing position, the length of the the second phase of childbirth, and newborn birth weight, .and the incidence of perineal laceration. Maternal birthing position was categorized as lithotomy and non-lithotomy. The the second phase of childbirth was categorized into two duration groups: ≤30 minutes and >30 minutes. Neonatal birth weight was categorized as <3500 g and ≥3500 g according to previous studies identifying birth weight ≥3500 g as a risk factor for perineal laceration [13]. Perineal laceration was recorded as present or absent based on labor documentation. The observation sheet was developed according to the operational definitions of the study variables and information recorded in labor documentation. . Before the data collection process began, the research instrument was evaluated by three experts in maternal and midwifery health to establish its content validity. The assessment resulted in an Item-Level Content Validity Index (I-CVI) ranging from 0.80 to 1.00, while the Scale-Level Content Validity Index/Average (S-CVI/Ave) was 0.93, demonstrating excellent content validity.

Data were processed through editing, coding, entry, and cleaning stages. The frequency and percentage distributions of the study variables were described using univariate analysis, while bivariate analysis was conducted with Fisher’s exact test because several cells had expected frequencies below five or contained zero values. This study obtained ethical approval from Ethical approval was obtained from the Research Ethics Committee of Jenderal Achmad Yani University, Yogyakarta (No. Skep/354/KEP/VI/2026). The study adhered to ethical principles concerning scientific and social value, equitable sharing of burdens and benefits, measures to minimize risks, safeguards against exploitation, protection of privacy and confidentiality, and informed consent.

## RESULT

This study involved 45 postpartum mothers who met the research criteria. The results are presented in the form of univariate and bivariate analyses.

**Table 1. Respondent Characteristics (n = 45)**

| Characteristics | Category | n | % |
|---|---|---|---|
| **Age (years)** | <20 | 3 | 6.7 |
| | 20–35 | 35 | 77.8 |
| | >35 | 7 | 15.5 |
| **Parity** | Primiparous | 16 | 35.6 |
| | Multiparous | 26 | 57.8 |
| | Grand multiparous | 3 | 6.6 |
| **Occupation** | Housewife | 28 | 62.2 |
| | Private employee | 8 | 17.8 |
| | Entrepreneur | 5 | 11.1 |
| | Farmer | 2 | 4.4 |
| | Others | 2 | 4.4 |
| **Gestational age** | 37–38 weeks | 10 | 22.2 |
| | 39–40 weeks | 27 | 60.0 |
| | 41–42 weeks | 8 | 17.8 |

Table 1 The table presents the characteristics of the respondents. Most participants were between 20 and 35 years of age (77.8%), while 15.5% were older than 35 years and 6.7% were younger than 20 years. Based on parity, the majority were multiparous (57.8%), followed by primiparous women (35.6%) and grand multiparous women (6.6%). Regarding occupation, most respondents were housewives (62.2%), whereas the remainder were private employees, entrepreneurs, farmers, and others. Most deliveries occurred at a gestational age of 39–40 weeks (60.0%), followed by 37–38 weeks (22.2%) and 41–42 weeks (17.8%).

**Table 2. Frequency Distribution of Delivery Position, Duration of Stage II, Birth Weight of Newborns, and Occurrence of Perineal Laceration (n=45)**

| Variable | Frequency (n) | Percentage (%) |
|---|---|---|
| **Delivery Position** | | |
| Lithotomy | 21 | 46.7 |
| Non-lithotomy | 24 | 53.3 |
| **Duration of Stage II** | | |
| ≤30 minutes | 36 | 80.0 |
| >30 minutes | 9 | 20.0 |
| **Birth Weight of Newborns** | | |
| <3500 grams | 37 | 82.2 |
| ≥3500 grams | 8 | 17.8 |
| **Occurrence of Perineal Laceration** | | |
| No laceration | 14 | 31.1 |
| laceration | 31 | 68.9 |

Table 2 The majority of respondents gave birth in a non-lithotomy position, with 24 respondents (53.3%). The duration of stage II was ≤30 minutes for 36 respondents (80.0%), and 37 newborns (82.2%) were born with a weight <3500 grams. The occurrence of perineal laceration was recorded in 31 respondents (68.9%), while 14 respondents (31.1%) did not experience perineal laceration.

**Table 3. Relationship Between Delivery Position and Occurrence of Perineal Laceration**

| Birthing Position | No laceration | | Laceration | | Total | | p-value | OR | 95% CI |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | | | |
| Lithotomy | 2 | 9.5 | 19 | 90.5 | 21 | 100.0 | | | |
| Non-lithotomy | 12 | 50.0 | 12 | 50.0 | 24 | 100.0 | 0.004* | **9.50** | **1.80-50.08** |

** p-value obtained using Fisher's Exact Test.*

Table 3 Demonstrates that women who gave birth in the lithotomy position had a higher proportion of perineal laceration than those who delivered in non-lithotomy positions (90.5% vs. 50.0%). The association between birthing position and perineal laceration was statistically significant (p = 0.004). Women who delivered in the lithotomy position had 9.50 times the odds of experiencing perineal laceration compared with those who delivered in non-lithotomy positions. The 95% CI of 1.80-50.08 remained above 1.0, although the wide interval indicates limited precision of the estimate.

**Table 4. Relationship Between Duration of Stage II and Occurrence of Perineal Laceration**

| Duration of Stage II | No laceration | | laceration | | Total | | p-value |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| ≤30 minutes | 14 | 38.9 | 22 | 61.1 | 36 | 100.0 | **0.040*** |
| >30 minutes | 0 | 0.0 | 9 | 100.0 | 9 | 100.0 | |

* Fisher's Exact Test was used because one expected cell count was less than 5 and one cell contained a zero value.

Table 4 shows that all women with a a the second phase of childbirth exceeding 30 minutes experienced perineal laceration (100.0%), whereas 61.1% of women whose second stage lasted ≤30 minutes experienced perineal laceration. The association between the length of the the second phase of childbirth and the occurrence of perineal lacerations was statistically significant (p = 0.040). These findings indicate that a prolonged an extended the second phase of childbirth was linked to a greater occurrence of perineal laceration.

**Table 5. Relationship Between Birth Weight of Newborns and Occurrence of Perineal Laceration**

| Birth Weight of Newborns | No laceration | | laceration | | Total | | p-value | OR | 95% CI |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | | | |
| <3500 gram | 14 | 37.8 | 23 | 62.2 | 37 | 100.0 | **0.044*** | **10.04** | **0.54-187.44** |
| ≥3500 gram | 0 | 0.0 | 8 | 100.0 | 8 | 100.0 | | | |

* Fisher's Exact Test was used because one expected cell count was less than 5 and one cell contained a zero value.

Table 5 shows that among women who delivered newborns weighing less than 3500 g, 23 (62.2%) experienced perineal laceration, whereas 14 (37.8%) did not. In contrast, all women who delivered newborns weighing ≥3500 g experienced perineal laceration (100.0%). The association between neonatal birth weight and perineal laceration was statistically significant (p = 0.044). An OR of 10.04 indicates higher estimated odds of perineal laceration among mothers who delivered newborns weighing ≥3500 g compared with those whose newborns weighed <3500 g. However, the 95% CI (0.54-187.44) is very wide, indicating low precision of the OR estimate, so it should be interpreted cautiously.

## DISCUSSION

This case highlights a clinically important presentation due to its [unique aspect, e.g., uncommon manifestation, rapid recovery, or response to intervention], which adds valuable insight to current clinical practice. Compared with previous studies, the findings are generally consistent in demonstrating that timely and appropriate management can lead to significant clinical improvement. However, certain differences may be explained by variations in patient characteristics, disease severity, and treatment approaches.

The observed outcomes may be attributed to several possible mechanisms, including effective control of inflammation, improved physiological response, and adherence to the prescribed intervention. These findings reinforce the importance of early detection and comprehensive management in achieving optimal patient outcomes. From a clinical perspective, this case provides practical implications for improving patient care, particularly in emphasizing targeted interventions and continuous monitoring. Nevertheless, this report has limitations, including its single-case design and limited generalizability. In conclusion, this case offers important lessons regarding the effectiveness of timely intervention and highlights the need for further research to strengthen the evidence base and guide clinical practice.

The present study demonstrated that maternal birthing position, the duration of the the second phase of childbirth and the newborn's birth weight showed a significant association with the incidence of perineal lacerations. These findings suggest that both labor-related factors and neonatal characteristics contribute to the risk of perineal laceration during vaginal birth. From a clinical perspective, identifying these factors is essential for improving intrapartum management and implementing preventive strategies aimed at reducing maternal birth-related trauma. Perineal laceration remains one one of the most common complications associated with vaginal delivery and may lead to maternal morbidity in both the short and long term, emphasizing the importance of recognizing women at increased risk during labor.

Women who delivered in the lithotomy position had significantly higher odds of experiencing perineal laceration than those who delivered in non-lithotomy positions (OR = 9.50; 95% CI: 1.80–50.08). This finding indicates that the lithotomy position may substantially contribute to a greater risk of perineal trauma during vaginal birth. A possible explanation is that the lithotomy position restricts sacral mobility and limits physiological widening of the pelvic outlet, thereby increasing tension on the perineal tissues during fetal expulsion. Consequently, the perineum may be less able to stretch gradually, increasing its susceptibility to laceration. The results observed in this study correspond with the results reported by [14], which reported that the use of a lateral maternal position during the the second phase of childbirth was linked to a decreased risk of moderate perineal laceration in nulliparous women. Another study also demonstrated that maternal position during childbirth significantly influenced perineal outcomes. [15] Furthermore, Findings from a Cochrane systematic review indicated that maternal position during the the second phase of childbirth affects perineal outcomes, although the effects vary according to the type of position and the severity of perineal trauma. [16] Collectively, these findings suggest that encouraging alternative birthing positions, when clinically appropriate and acceptable to the mother, may contribute to reducing the risk of perineal laceration while maintaining maternal comfort and safety.

The present study also showed a significant relationship between a prolonged the second phase of childbirth and perineal lacerations. An extended second stage increases the duration of continuous pressure exerted by the fetal head on the perineal tissues, leading to tissue edema, reduced elasticity, impaired perfusion, and greater susceptibility to laceration during fetal descent. Previous research reported that increasing an extended duration of the the second phase of childbirth was linked to a greater risk of obstetric anal sphincter injury and

episiotomy.[17]

Another study identified prolonged labor as an important contributor to severe perineal laceration. [18] A population-based study also found that obstetric anal sphincter injury occurred more frequently among women experiencing an extended the second phase of childbirth. [19] Furthermore, every 15-minute increase in the length of the second stage before assisted delivery was associated with a 6% increase in the risk of obstetric anal sphincter injury.[20] Another investigation demonstrated that women experiencing a second-stage duration of ≥120 minutes had a substantially higher risk of obstetric anal sphincter injury, particularly when accompanied by greater neonatal birth weight.[21] Collectively, these The results suggest that an extended second-stage labor may amplify the effects of other obstetric risk factors, thereby increasing the likelihood of perineal laceration. Therefore, careful monitoring of labor progress and timely obstetric management are essential to minimize prolonged perineal compression and reduce maternal birth trauma.

Neonatal birth weight was also significantly associated with perineal laceration in the present study. Larger infants exert greater mechanical pressure on the maternal perineum during fetal descent, resulting in increased tissue stretching and a higher probability of laceration. Previous studies have identified high neonatal birth weight as an important determinant of perineal trauma.[22] An Indonesian study also demonstrated that birth weight was an independent factor associated with the severity of perineal laceration.[12] Another study reported that increasing neonatal birth weight was associated with a higher likelihood of obstetric anal sphincter injury.[18] Further evidence from a systematic review and meta-analysis identified increased birth weight as a significant risk factor for severe perineal lacerations.[23] Similarly, fetal birth weight greater than 4,000 g has been identified as an independent factor associated with obstetric anal sphincter injury.[24] Although several previous studies used a birth-weight threshold of ≥4,000 g, the present study demonstrated that newborns weighing ≥3,500 g were also associated with an increased occurrence of perineal laceration. This finding suggests that even moderately elevated birth weight should be considered during antenatal and intrapartum risk assessment, particularly when combined with other labor-related risk factors.

Overall, the findings of this study emphasize that maternal birthing position, the length of the the second phase of childbirth, and neonatal birth weight should not be considered in isolation but rather as interrelated factors contributing to the occurrence of perineal

lacerations. These results provide important insights for clinical practice within maternity care. Midwives and other maternity care providers should encourage women to adopt appropriate birthing positions whenever clinically feasible, closely monitor labor progress to prevent unnecessary prolongation of the second stage, and anticipate perineal injury in women carrying larger infants. In addition, proper perineal protection methods and controlled delivery of the fetal head should be incorporated into routine intrapartum care to reduce the occurrence of perineal laceration and promote better maternal outcomes.

Several limitations should be considered in this study. First, the limited sample size and cross-sectional study design may restrict the generalizability of the results and prevent conclusions regarding causal relationships. Second, the use of purposive sampling may have introduced selection bias, as participants were recruited according to predefined eligibility criteria rather than through probability sampling, potentially limiting the representativeness of the study population. This sampling approach may also have introduced purposive sampling bias, because the selected participants may not fully represent all women giving birth in primary maternity care settings. Third, information bias may have occurred because the study relied on labor records and structured observation sheets, the accuracy of which depended on the completeness and quality of clinical documentation. Finally, residual confounding cannot be excluded because several important variables, including parity, maternal age, episiotomy, fetal head position, fetal head circumference, pushing technique, instrumental delivery, and perineal protection techniques, were not controlled using multivariable analysis. Therefore, future multicenter studies involving larger sample sizes and multivariable analytical approaches are needed to confirm and strengthen these findings and identify the most influential determinants of perineal laceration.

## CONCLUSIONS

This study demonstrates that maternal birthing position, the length of the the second phase of childbirth and neonatal birth weight are important factors associated with the occurrence of perineal laceration during vaginal birth. These results underscore the need for comprehensive risk assessment during labor to enable early recognition of women who are more likely to experience perineal injury. Midwives should routinely assess maternal birthing position, monitor the time required to complete the the second phase of childbirth, and anticipate the potential impact of higher neonatal birth weight to lower the likelihood of perineal laceration. The implementation of appropriate birthing positions, timely labor

management, and evidence-based perineal protection strategies may contribute to improving maternal outcomes and reducing birth-related perineal trauma.

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## AUTHOR CONTRIBUTIONS

IK: Conceptualization, .Methodology, .Investigation, .Data .Collection, .Formal .Analysis, Writing – Original Draft, and Writing – Review & Editing. NZ: Methodology, Validation, Data Curation, and Writing – Review & Editing. ARA: Supervision, Project Administration, and Writing – Review & Editing. IL: Validation, Resources, and Writing – Review & Editing. NN: Supervision, Resources, and Writing– Review & Editing. The authors jointly interpreted the findings, reviewed the manuscript, and approved the final version for publication.

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