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Risk Factors Associated with Perineal Lacerations During Vaginal Delivery at Aura Syifa Hospital, Kediri in 2025

Estin Gita Maringga[1*], Linda Andri Mustofa[2], Heni Puji Lestari[3]

[1,2,3]Sekolah Tinggi Ilmu Kesehatan Karya Husada Kediri
Email: estingita1012@gmail.com

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**Correspondence:*
Estin Gita Maringga
estingita1012@gmail.com
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Abstract

Perineal laceration remains one of the most frequently encountered complications in vaginal childbirth, potentially resulting in significant maternal discomfort and, in severe conditions, contributing to adverse maternal outcomes. Based on data that observed at RS Aura Syifa, where 81.1% of spontaneous deliveries in 2024 involved perineal laceration. This study was aimed to explore determinants associated with the occurrence of perineal lacerations among vagonal birth at RS Aura Syifa in 2025. A retrospective approach was applied utilizing secondary data derived from hospital medical records. The study encompassed deliveries recorded between January and December 2025. The target population included all women with term gestation who underwent vaginal birth with cephalic fetal presentation, about 725 cases. A total of 209 subjects were selected through a simple random sampling method. Data management procedures involved verification, coding, and tabulation prior to statistical analysis using stata software. Analytical methods included descriptive (univariate), associative (bivariate), and predictive (multivariate) analyses using logistic regression. The results showed that parity as a statistically significant predictor of perineal laceration (p = 0.035). The calculated odds ratio (Exp(B) = 0.117) indicates that women with prior childbirth experience (multiparous and grand multiparous) exhibited a markedly reduced likelihood of sustaining perineal trauma compared to first-time mothers (primiparous). These findings highlight the importance of comprehensive delivery planning and appropriate intrapartum management to reduce the risk of maternal pain and minimize injury to the perineal laceration during vaginal birth.

Keywords: *perineal, lacerations, vaginal delivery*

INTRODUCTION

Childbirth is a natural physiological event through which a woman expels the products of conception, either through spontaneous vaginal delivery or with medical assistance (Sigalingging et al., 2018). Despite being a normal process, labor is often accompanied by complications, one of the most frequently reported being perineal trauma, particularly in vaginal births. Perineal laceration is defined as damage to the perineal tissues and adjacent structures of the birth canal occurring during the delivery process, regardless of whether instruments are used (Hukubun et al., 2021a). Such trauma may present as either spontaneous tears or as a result of episiotomy procedures (Al Hanouf et al., 2018).

Based on Health Minstry data 2024 the Maternal mortality rate in Indonesia 2020 was 189 per 100,000 live births. One of the causes of maternal death was obstetric hemorrhage, accounting for 955 cases, including perineal laceration. At the provincial level, the East Java Health Profile 2023 reported a slight increase in the maternal mortality ratio (MMR) to 93.73 per 100,000 live births, compared to 93.00 in 2022. The predominant causes of maternal death were hypertensive disorders, obstetric hemorrhage, and non-obstetric complications based on ICD-10 classification (Kementerian Kesehatan RI, 2024).

Among 3,791 recorded cases, 63% required suturing, with 42% attributed to episiotomy and 38% resulting from spontaneous lacerations (Nurhayati et al., 2023). The incidence is particularly high among primiparous and younger women, reaching nearly 90%, and is closely associated with postpartum morbidity and mortality (Julie et al., 2020). In Kediri Regency, maternal mortality showed a slight decline in 2023, with 10 reported deaths compared to 11 cases in the previous year. The main contributing factors were heart disease and preeclampsia (each accounting for 30%), followed by hemorrhage (20%) and other causes (20%). Notably, all maternal deaths occurred during the postpartum period (Dinas Kesehatan Kabupaten Kediri, 2024).

Based on primary data at RS Aura Syifa that collected in July 2025 indicated that, about 936 vaginal deliveries recorded between January and December 2024, 760 cases (81.1%) were complicated by perineal lacerations. Interviews with midwives suggested that these cases were commonly associated with parity, neonatal birth weight, and prolonged second stage of labor. The incidence of perineal lacerations during labor is influenced by multiple factors, which are categorized into maternal, fetal, and procedural during labor factors. Maternal determinants include parity, previous childbirth experience, maternal age under 20 years, and anatomical characteristics such as a short perineal body (<25 mm) (Waldenström & Ekéus, 2017). Interval of intrapartum is also recognized as an important contributing factor (Lenden et al., 2020). Risk factors based on infant include macrosomia (birth weight exceeding 4000 grams), shoulder dystocia, occiput

posterior fetal position, and larger head circumference (Goh, 2018). In addition, procedural during labor such as instrumental delivery, prolonged second stage of labor (more than 60 minutes), use of analgesia, oxytocin administration, episiotomy, and maternal birthing position play a significant role (Chamsi, 2018).

Perineal laceration has wide-ranging consequences for women, extending beyond physical injury to affect psychological health, social interactions, family roles, breastfeeding practices, and sexual function. Evidence from studies conducted in the United Kingdom indicates that short-term complications include perineal pain, discomfort, dyspareunia, as well as urinary and fecal incontinence during the postpartum period (Ahmed, 2019). Furthermore, some women may continue to experience persistent perineal pain in the long term (Ahmed, 2019). If not managed appropriately, perineal lacerations may lead to serious reproductive health complications, including hemorrhage and infection, which in severe cases can contribute to maternal mortality due to bleeding or sepsis (Nurhayati et al., 2023).

Various preventive strategies can be implemented to reduce the incidence of perineal trauma. These include educating pregnant women on appropriate birthing positions and effective pushing techniques, as well as encouraging routine perineal massage during the final weeks of pregnancy to improve tissue elasticity (Rochmayanti & Ummah, 2018). During the second stage of labor, particularly at the time of crowning, controlled delivery techniques are applied, such as supporting the perineum and regulating fetal head extension to minimize tissue damage while avoiding unnecessary episiotomy (RCOG, 2015).

Indonesian Ministry of Health release a regulation No. 28 of 2017, midwives are authorized to manage and suture first- and second-degree perineal tears, while more severe cases (third- and fourth-degree) must be referred to higher-level care facilities (Kementerian Kesehatan, 2017). Additional preventive measures include providing counseling on comfortable birthing positions, applying warm compresses to relax perineal muscles, and guiding mothers to push in a controlled manner. Continuous professional development and adherence to evidence-based practices are essential for midwives to reduce the risk of perineal injury. Based on these considerations, this study aims to identify the factors associated with the occurrence of perineal lacerations among delivering mothers.

METHODS

A retrospective study design was applied in this research, which was carried out at Aura Syifa Hospital. The study utilized secondary data obtained from medical records covering the period from January to December 2025. The study population consisted of all women with term pregnancies who underwent vaginal delivery with cephalic presentation, totaling 725 cases.

From this population, 209 participants were selected using a simple random sampling technique. Prior to analysis, the collected data were subjected to data cleaning procedures, including verification, coding, and tabulation. Statistical analysis was performed using Stata software. The analytical approach included univariate analysis to describe the characteristics of the data, bivariate analysis to assess associations between variables, and multivariate analysis using logistic regression to identify independent predictors. A p-value of less than 0.05 was considered to indicate statistical significance.

FINDINGS AND DISCUSSION

RESULT

Frequency Distribution Analysis

Analysis in this study aims to provide a descriptive overview of the respondents' characteristics. The characteristics of respondents based on age are presented in Table 1.

Table 1. Frequency Distribution of Age

Age	Frequency	Percentage
Non-risk Age Group (20–35 Years)	171	81.8
Risk Age Group (Age <20 Years and >35 Years)	38	18.2
Total	209	100

Table 1 shows that 171 respondents in this study (81.8%) were in the non-risk age category (20–35 years). Meanwhile, 38 respondents (18.2%) were categorized as being in the at-risk age group.

Table 2. Frequency Distribution of Parity

Parity	Frequency	Percentage
Primipara (1 child)	102	48.8
Multipara (2-4 children)	105	50.2
Grandemultipara (5 or more children)	2	1
Total	209	100

Based on the information in Table 2, it was found that 105 respondents were classified as multipara (2–4 children), while only 2 respondents were classified as grand multipara.

Table 3. Frequency Distribution of Birth Interval

Birth Interval	Frequency	Percentage
Non-risk Birth Interval (2–5 years)	77	36.8
No Interval (Primipara)	30	14.4
At Risk (< 2 years or more than 5 years)	102	48.8
Total	209	100

The birth interval was categorized into three groups, as presented in Table 3. Based on the table, 102 respondents in this study fell into the at-risk category, while 77 respondents were classified as non-risk.

Table 4. Frequency Distribution of Infant Birth Weight

Infant Birth Weight	Frequency	Percentage
Normal Birth Weight	194	92.8
Low Birth Weight	15	7.2
Total	209	100

Based on table 4, In this study, nearly all infant were in the normal birth weight category, with 194 respondents (92.8%). Only 15 respondents had low birth weight.

Table 5. Frequency Distribution of Head Circumference

Head Circumference	Frequency	Percentage
Normal	209	100
At risk ((≤35 cm)	0	0
Total	209	100

In this study, all infants (100%) had a head circumference within the non-risk range (≤35 cm).

Table 6. Frequency Distribution of Duration of Second Stage of Labor

Duration of Second Stage of Labor	Frequency	Percentage
Normal Second Stage of Labor (2 hours for primipara and 1 hours for multipara)	197	94.3
Prolonged Second Stage of Labor (more than 2 hours for primipara and more than1 hours for multipara))	12	5.7
Total	209	100

In this study, almost all respondents (94.3%) had a non-prolonged second stage of labor. Only 12 respondents, or approximately 5.7% of the total sample, experienced a prolonged second stage of labor.

Table 7. Frequency Distribution of Perineal Laceration

Perineal Laceration	Frequency	Percentage
Spontaneous Perineal Laceration	110	52.6
Episiotomy	99	47.4
Total	209	100

Table 7 provides information on the frequency distribution of perineal laceration. Based on the results in Table 7, the percentages of respondents with spontaneous perineal laceration and episiotomy were almost equal. There were 110 respondents (52.6%) with spontaneous perineal laceration, while 99 respondents (47.4%) had an episiotomy.

2. Cross-tabulation Analysis

Cross-tabulation analysis provides information on the relationship between two variables.

Table 8. Cross-tabulation of Age and Birth Canal Tears

		Perineal Laceration		Total
		Spontaneous	Episiotomy	
Age	Non-risk age (20–35 years)	84	87	171
	At risk age (<20 years and >35 years)	26	12	38

Table 8 presents the cross-tabulation between age perienal laceration. Based on the information in the table, 87 respondents in the non-risk age group had an episiotomy, while 84 respondents in this age group experienced laceration. Among respondents in the at-risk age group, 12 had an episiotomy and 26 had spontaneous perineal laceration.

Table 9. Cross-tabulation of Parity and Birth Canal Tears

		Perineal Laceration		
		Spontaneous	Episiotomy	Total
Parity	Primiparous (1 child)	16	86	102
	Multiparaous (2-4 children)	92	13	105
	Grandemultipara (more than 5 children)	2	0	2

The cross-tabulation between parity and perineal laceration is presented in Table 9. Based on the table, 92 respondents who were multiparous experienced spontaneous perineal laceration. The table also shows that among primiparous respondents, 86 had an episiotomy.

Table 10. Cross-tabulation of Birth Interval and Perineal Laceration

		Perineal Laceration		
		Spontaneous	Episiotomy	Total
Birth Interval	Non-risk birth interval (2–5 years)	70	7	77
	Primiparous	24	6	30
	At-risk	16	86	102

Table 10 shows that the highest frequency, 86 respondents with an at-risk birth interval, had an episiotomy. Among respondents with a non-risk birth interval, 70 experienced spontaneous perineal laceration.

Table 11. Cross-tabulation of Infant Birth Weight and Perineal Laceratiom

		Perineal Laceration		
		Spontaneus	Episiotomy	Total
Infant Birth Weigth	Normal Birth Weight	102	92	194
	Low Birth Weight	8	7	15

Table 11 presents information on infants by birth weight. Among normal-weight infants, 102 experienced spontaneous perineal laceration while 92 had an episiotomy. Among low-birth-weight infants, 8 had spontaneous tears and 7 had an episiotomy.

Table 12. Cross-tabulation of Duration of Second Stage of Labor and Perineal Laceration

		Perineal Laceration		
		Spontaneous	Episiotomy	Total
Duration of Second Stage of Labor	Non-prolonged second stage of labor (≤2 hours for primigravida, ≤1 hour for multigravida)	102	95	197
	Prolonged second stage of labor (>2 hours for primigravida, >1 hour for multigravida	8	4	12

In the cross-tabulation of the duration of the second stage of labor and perienal laceratiuon (Table 12), among 197 respondents with a non-prolonged second stage, 102 experienced spontaneous perineal laceration and 95 had an episiotomy. Among respondents with a prolonged second stage, 8 had spontaneous tears and 4 had an episiotomy.

3. Logistic Regression Analysis

The next stage of analysis was logistic regression to determine the risk factors for birth canal tears. This study used logistic regression analysis based on a dependent variable with a binary category: spontaneous tears and episiotomy. The results of the logistic regression analysis are presented in Table 12 below.

Table 13. Logistic Regression Analysis

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1[a]	Age	-.013	.550	.001	1	.981	.987
	Parity	**-2.142**	**1.017**	**4.441**	**1**	**.035**	**.117**
	Birth of Interval	.940	.602	2.439	1	.118	2.560
	Infant Birth Weight	-.802	.722	1.234	1	.267	.448
	Duration of Second Stage	-.164	.967	.029	1	.865	.849
	Constant	-.098	1.243	.006	1	.937	.907

Table 13 presents the results of the logistic regression analysis. Based on the table, parity was the variable that had a significant effect on perineal laceration. This conclusion is based on the significance value of 0.035, which is less than 0.05.

The regression coefficient for parity was -2.142. This indicates that for each increase in the parity category (e.g., from primiparous to multiparous), the log-odds of undergoing an episiotomy decrease by 2.142 units. The odds ratio (Exp(B)) of 0.117 means that mothers with a history of more than one birth

(multiparous/grand multiparous) have a 0.117 times lower likelihood of undergoing an episiotomy compared to mothers giving birth for the first time (primiparous).

DISCUSSION

The result in this study showed that 209 women who had normal vaginal delivery at RS Aura Syifa Kediri revealed that slightly more than half of the participants (52.6%) experienced spontaneous perineal lacerations. Findings from the multivariate logistic regression model demonstrated that parity had a regression coefficient of -2.142, indicating an inverse relationship between parity and the likelihood of perineal intervention. In practical terms, each increase in parity level (for example, from primiparous to multiparous) corresponded to a reduction in the log-odds of undergoing episiotomy. This was further supported by the odds ratio (Exp(B) = 0.117), suggesting that women with prior childbirth experience had a substantially lower probability of requiring episiotomy compared to first-time mothers.

Spontaneous perineal laceration indicate that most perineal lacerations occur naturally as a response to the vaginal delivery process, during which the perineal tissue stretches beyond its elastic limit. Episiotomy is a surgical incision made in the perineum to facilitate delivery. Episiotomy is still performed in over 50% of vaginal deliveries and most commonly occurs in nulliparous women. (Stik & Palembang, 2014). According to Richard's theory, episiotomy is generally performed on women giving birth for the first time. However, episiotomy may sometimes be performed in subsequent deliveries, depending on the situation; it is done if a tear is likely to occur. In primigravida, the incidence of episiotomy ranges from 0–95%, whereas in multigravida it is lower because the perineal tissue becomes more elastic.(RCOG, 2015)

The findings of this study are also consistent with previous research, indicating that primiparous women are at a higher risk of experiencing more severe perineal lacerations (Jansson et al., 2020) This may be attributed to the lower elasticity of the perineum in primiparous women compared to multiparous women. Additionally, the perineal muscles in primiparous women are more susceptible to stretching during vaginal delivery (Addisu & Fentahun, 2024). The partial test results for each independent variable showed that the most dominant factor affecting the occurrence of perineal rupture was maternal parity, with a significance value of 0.035. Based on these findings, the researchers suggest that higher maternal parity may reduce the risk of spontaneous perineal laceration. This can be related to the mother's previous childbirth experience.

The results of this study are consistent with previous research indicating that primigravida women have a higher risk of experiencing perineal lacerations, with a p-value < 0.05 and a negative correlation. This implies that lower parity is associated with a higher degree of perineal rupture. Therefore, it can be concluded

that maternal parity has a significant relationship with the degree of perineal rupture during childbirth. (Hukubun et al., 2021b)

Perineum is part of the birth canal located between the vagina and anus, formed by a combination of perineal membrane muscles, including the bulbocavernosus, superficial and deep transverse perineal muscles, along with the puborectalis muscle, which is part of the levator ani, and the external anal sphincter. The perineal region receives blood supply from branches of the internal pudendal artery and sensory and motor innervation from the pudendal nerve. In normal women, the perineal body length is approximately 3–5 cm and may be reduced in cases of advanced pelvic organ prolapse or poorly managed postpartum perineal tears. Significant perineal trauma causing rupture or disruption of the muscles forming the perineum, especially the levator ani and anal sphincter, can result in defecation disorders such as fecal incontinence, with severity varying among individuals. Additionally, sexual dysfunction, leukorrhea, and recurrent urinary tract infections may occur (Urasaki et al., 2023)

Perineal laceration occur in all first deliveries and are also common in subsequent deliveries. These tears can be prevented or minimized by controlling the speed at which the fetal head passes through the pelvic floor. Conversely, the fetal head should not be held back too strongly or for too long, as this may cause fetal asphyxia and intracranial bleeding, as well as weaken the muscles and fascia of the pelvic floor due to prolonged stretching.

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