



THE DIFFERENCE IN PERINEAL TEARS BETWEEN THE VALSAVA PUSHING TECHNIQUE AND THE BLOW-BLOW PUSHING TECHNIQUE IN WOMEN IN LABOR

Bayti Jannah¹, Putri Yayu², Nanda Irmawati³

*^{1,2,3}Akbid Harapan Bunda Bima; jln.Imam Bonjol no.56 Santi Barat Kota Bima, telp.44552
Corresponding Email: *baytijannah707@gmail.com*

Submitted: 28-09-2025

Article History
Revision: 03-01-2026

Published: 30-03-2026

ABSTRACT

Perineal tears are one of the most common complications during vaginal delivery and may contribute to maternal morbidity and postpartum hemorrhage. The pushing technique used during the second stage of labor plays an important role in determining maternal outcomes. This study aimed to analyze the difference in perineal tears between the Valsalva pushing technique and the blow-blow pushing technique among women giving birth in the West Dompu Community Health Center area. This study used a quasi-experimental design with a posttest-only non-equivalent control group approach. The population consisted of 45 mothers giving birth between July and September 2025. A total of 32 respondents were selected using quota sampling and divided into two groups: 16 mothers using the Valsalva pushing technique and 16 mothers using the blow-blow pushing technique. Data were collected using an observation sheet that recorded maternal characteristics and the degree of perineal tear. Data were analyzed using the Mann-Whitney test. The results showed a significant difference in the incidence of perineal tears between the two groups ($p < 0.001$). Mothers who applied the blow-blow pushing technique experienced fewer perineal tears compared to those who used the Valsalva technique. The blow-blow technique may be considered an alternative pushing method to reduce the risk of perineal tears during childbirth.

Keywords: Valsalva technique, blow-blow technique, perineal tear, labor

Copyright © 2026 by Authors. This is an open access article under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license.



ABSTRAK

Robekan perineum merupakan salah satu komplikasi paling umum selama persalinan pervaginam dan dapat berkontribusi pada morbiditas ibu dan perdarahan postpartum. Teknik mengejan yang digunakan selama tahap kedua persalinan memainkan peran penting dalam menentukan hasil persalinan ibu. Penelitian ini bertujuan untuk menganalisis perbedaan robekan perineum antara teknik mengejan valsalva dan teknik mengejan tiup-tiup di antara ibu yang melahirkan di wilayah Puskesmas Dompu Barat. Penelitian ini menggunakan desain kuasi-eksperimental dengan pendekatan kelompok kontrol non-ekuivalen posttest-only. Populasi terdiri dari 45 ibu yang melahirkan antara Juli dan September 2025. Sebanyak 32 responden dipilih menggunakan pengambilan sampel kuota dan dibagi menjadi dua kelompok: 16 ibu menggunakan teknik mengejan Valsalva dan 16 ibu menggunakan teknik mengejan tiup-tiup. Data dikumpulkan

menggunakan lembar observasi yang mencatat karakteristik ibu dan tingkat robekan perineum. Data dianalisis menggunakan uji Mann-Whitney. Hasil menunjukkan perbedaan signifikan dalam kejadian robekan perineum antara kedua kelompok ($p < 0,001$). Ibu yang menggunakan teknik mengejan tiup-tiup mengalami lebih sedikit robekan perineum dibandingkan dengan mereka yang menggunakan teknik Valsalva. Teknik tiup-tiup dapat dianggap sebagai metode mengejan alternatif untuk mengurangi risiko robekan perineum selama persalinan.

Kata kunci: Teknik meneran valsava, Teknik meneran tiup-tiup, Robekan perineum, Persalinan

Copyright © 2026 by Authors. This is an open access article under the [CC-BY-SA](#) license.



INTRODUCTION

Childbirth is a physiological process in which the fetus and placenta are expelled from the uterus through the birth canal (Indah et al., 2019). The success of the childbirth process is influenced by several factors, including uterine power, maternal pushing techniques, the birth canal, fetal factors, maternal psychological condition, and the skills of birth attendants. An imbalance among these factors may lead to complications during delivery, including pelvic floor muscle dysfunction and perineal tears (Mar'atussaliha et al., 2024).

Perineal tears are among the most common complications of vaginal delivery and remain a significant concern in maternal health. Perineal trauma remains common worldwide, particularly in low- and middle-income countries where access to optimal obstetric care may vary (World Health Organization (WHO), 2023). In Indonesia, the incidence of perineal tears varies across maternal age groups. Studies report that approximately 24% of women aged 25–30 years experience perineal tears during childbirth, while the incidence increases to 62% among women aged 32–39 years (Supiani & Yusuf Nurlathifah N, 2023). Furthermore, complications associated with perineal trauma can contribute to maternal morbidity and mortality, particularly when severe lacerations lead to excessive bleeding or infection (Riyanti et al., 2023).

Maternal mortality remains a major public health challenge worldwide, including in Indonesia. Data from the Dompu District Health Office indicate fluctuations in maternal mortality rates over recent years. In 2021, the maternal mortality rate reached 121 per 100,000 live births (7 deaths). This rate decreased to 34 per 100,000 live births in 2022 (2 deaths), increased again to 65 per 100,000 live births in 2023 (3 deaths), and decreased to 34 per 100,000 live births in 2024 (2 deaths) (Dinas Kesehatan Dompu, 2025). These data suggest that efforts to prevent complications during childbirth, including those related to perineal trauma, remain essential.

Perineal tears may lead to several adverse maternal outcomes. Severe lacerations can cause postpartum hemorrhage, which is one of the leading causes of maternal mortality. Bleeding due to perineal tears is considered the second most common cause of postpartum hemorrhage after uterine atony (Maftukha & Suparmi, 2024). In addition, perineal trauma may increase the risk of infection, delayed wound healing, and long-term complications such as dyspareunia (pain during sexual intercourse) (Sinuhaji et al., 2024). Tears located close to the anal area are particularly vulnerable to bacterial contamination from feces, which may further increase the risk of infection and prolonged healing processes (Iqmy & Minhayati, 2019). Therefore, preventive strategies to reduce perineal trauma during labor are highly important.

Several interventions have been proposed to reduce the risk of perineal tears during childbirth. Non-pharmacological approaches such as perineal massage and pelvic floor muscle exercises are widely recommended. Perineal massage during late pregnancy can increase blood circulation, soften the perineal tissues, and improve tissue elasticity, thereby reducing the likelihood of perineal tears during

delivery (Darmayanti et al., 2024). Similarly, Kegel exercises strengthen the pelvic floor muscles and improve their elasticity, which can support the labor process and reduce trauma to the birth canal (Putri et al., 2024).

Another important factor influencing perineal trauma is the maternal pushing technique during the second stage of labor. In many clinical settings, women commonly use the Valsalva maneuver, which involves taking a deep breath, holding it, and pushing forcefully during uterine contractions. Although this technique is widely practiced, prolonged closed-glottis pushing may increase intrathoracic pressure, reduce venous return, decrease uteroplacental blood flow, and place excessive pressure on the pelvic floor muscles. These physiological changes may increase the risk of perineal trauma and negatively affect fetal oxygenation (Darwis & Ristica, 2022).

An alternative approach is the blow-and-blow pushing technique, which uses an open-glottis breathing method. In this technique, the mother takes a deep breath through the nose and exhales slowly through the mouth while producing a blowing sound during contractions (Bahar, 2024). This controlled breathing helps maintain maternal oxygenation, stabilizes hemodynamic circulation, and allows gradual fetal descent through the birth canal. As a result, the pressure on the pelvic floor muscles may be reduced, potentially lowering the risk of perineal tears (Pertiwi et al., 2022).

Several previous studies have examined maternal pushing techniques in relation to childbirth outcomes. For instance, Ahmadi et al. (2017) reported that alternative pushing techniques could reduce the incidence of perineal tears and neonatal asphyxia. Other studies have focused on preventive interventions such as perineal massage and pelvic floor exercises (Maftukha & Suparmi, 2024). However, empirical evidence specifically evaluating the effectiveness of the blow-and-blow pushing technique in preventing perineal tears remains limited. In addition, previous studies rarely examine this technique within the context of Indonesian maternal health services.

Therefore, this study aims to analyze the effect of the blow-and-blow pushing technique on the incidence of perineal tears during childbirth. The findings of this study are expected to contribute to the existing body of knowledge by providing empirical evidence regarding the effectiveness of controlled breathing techniques during labor, particularly in reducing perineal trauma among women giving birth in clinical settings.

METHOD

This study used a quasi-experimental design with a posttest-only non-equivalent control group approach. The study population consisted of 45 mothers who delivered at the West Dompu Community Health Center between July and September 2025. The sample consisted of 32 mothers, selected using quota sampling and divided into two groups: Group A : 16 mothers using the Valsalva pushing technique and Group B : 16 mothers using the blow-blow pushing technique

Inclusion criteria : (1) Mothers with normal vaginal delivery, (2) Mothers in the second stage of labor, (3) Mothers willing to participate in the study. Exclusion criteria: (1) Mothers with pathological labor, (2) Mothers undergoing instrumental delivery, (3) Mothers who refused participation. The independent variable in this study was the pushing technique during labor (Valsalva vs blow-blow). The dependent variable was the degree of perineal tear. The degree of perineal tear was classified into: No tear, First degree, Second degree and Third degree.

Several maternal and neonatal characteristics that may influence the occurrence of perineal tears were recorded, including: Maternal age, Parity and Infant birth weight. These variables were documented to assess baseline comparability between groups and to identify potential confounding factors influencing perineal outcomes. Data were collected using a structured observation checklist developed by the researchers. The instrument was used to record maternal demographic

characteristics and clinical variables, including maternal age, educational level, parity, infant birth weight, and the occurrence and degree of perineal tears. Observations were conducted during the second stage of labor by trained health personnel. Information related to maternal characteristics was obtained through interviews and review of medical records.

Data analysis was conducted using descriptive and inferential statistics. Descriptive statistics were used to summarize maternal characteristics and study variables. Bivariate analysis was performed to examine the difference in the incidence of perineal tears between the two groups. Because the data were not normally distributed and the sample size was relatively small, the Mann–Whitney test was used to compare outcomes between groups. Statistical significance was determined at a p-value < 0.05. This study received ethical approval from the Ethics Committee of STIKES Banyuwangi with approval number 279/04/KEPK-STIKESBWI/VII/2024–2025. Written informed consent was obtained from all participants prior to data collection, and confidentiality of participant information was maintained throughout the study.

RESULTS AND DISCUSSION

Table 1 Distribution Characteristics Of Respondents

Characteristics	Valsalva Technique (n=16)	Blow-Blow Technique (n=16)	Total(n=32)
Maternal Age			
<20 years	2 (12.5%)	2 (12.5%)	4 (12.5%)
20-35 years old	11 (68.7%)	11 (68.7%)	22 (68.7%)
>35 years	3 (18.8%)	3 (18.8%)	6 (18.8%)
Parity			
Primipara	6 (37.5%)	5 (31.3%)	11 (34.4%)
Multipara	10 (62.5%)	11 (68.7%)	21 (65.6%)
Baby Weight			
2500-4000gr	15 (93.7 %)	15 (93.7 %)	30 (93.7 %)
>4000gr	1 (6.3%)	1 (6.3%)	2 (6.3%)

Baseline characteristics of respondents are presented in Table 1. Most mothers in both groups were aged 20–35 years (68.7%), multiparous (65.6%), and delivered infants weighing 2500–4000 g (93.7%).

Table 2 Distribution of Perineal Tears by Pushing Technique

Degree of Perineal Tear	Valsalva Technique (n=16)	Blow-Blow Technique (n=16)
No tear	0 (0%)	16 (100%)
Grade 1	0 (0%)	0 (0%)
Grade 2	15 (93.7%)	0 (0%)
Grade 3	1 (6.3%)	0 (0%)

Table 2 shows the distribution of perineal tears according to the pushing technique. In the Valsalva group, most mothers experienced second-degree perineal tears (93.7%), while one respondent (6.3%) experienced a third-degree tear. In contrast, no perineal tears were observed in the blow-and-blow group.

Table 3 Comparison of Perineal Tear Scores Between Groups

Variable	Valsalva (n=16)	Blow-Blow (n=16)	Z	p-value	Effect Size (r)
Perineal Tear Degree	Median = 2 (IQR 2–2)	Median = 0 (IQR 0–0)	-5.488	<0.001	0.97

Table 3 shows the comparison of perineal tear scores between mothers who used the Valsalva pushing technique and those who used the blow-and-blow pushing technique. The results indicate that the median perineal tear score in the Valsalva group was 2 (IQR 2–2), while the blow-and-blow group had a median score of 0 (IQR 0–0). The Mann–Whitney test showed a statistically significant difference between the two groups ($Z = -5.488$; $p < 0.001$). The effect size ($r = 0.97$) indicates a large effect, suggesting that the blow-and-blow pushing technique was associated with a lower degree of perineal tears compared with the Valsalva technique.

DISCUSSION

This study examined differences in perineal tear outcomes between mothers who used the Valsalva pushing technique and those who used the blow-and-blow breathing technique during the second stage of labor. The findings showed a clear difference between the two groups. Mothers in the Valsalva group predominantly experienced second-degree perineal tears, whereas no perineal tears were observed in the blow-and-blow group. Statistical analysis using the Mann–Whitney test demonstrated a significant difference in perineal tear scores between the two techniques with a large effect size.

The baseline characteristics of respondents showed that most mothers were aged 20–35 years, multiparous, and delivered infants weighing between 2500 and 4000 grams. These characteristics represent the typical reproductive age group and are generally associated with lower obstetric risk compared with pregnancies occurring at younger or older ages. Previous studies have reported that maternal age, parity, and infant birth weight may influence the occurrence of perineal trauma during childbirth. Younger mothers may have immature reproductive organs, while advanced maternal age may be associated with reduced tissue elasticity and higher obstetric risk (Heriani & Indra Sulistiawati, 2025). In addition, primiparous women are more likely to experience perineal tears because the perineal tissues have not previously undergone stretching during childbirth (Mar’atussaliha et al., 2024). Higher birth weight may also increase mechanical pressure on the birth canal, thereby increasing the likelihood of perineal trauma (Ashri, 2024).

The difference in perineal tear outcomes observed in this study may be related to differences in the physiological mechanisms of the two pushing techniques. The Valsalva maneuver involves closed-glottis pushing in which the mother holds her breath and generates strong intra-abdominal pressure during contractions. Although this technique may accelerate fetal descent, it can also increase pressure on the pelvic floor muscles and perineal tissues (Darwis & Ristica, 2022). In contrast, the blow-and-blow technique uses an open-glottis breathing pattern that allows mothers to exhale gradually during contractions. This breathing pattern may facilitate more controlled fetal descent and allow the perineal tissues to stretch progressively during crowning. Gradual stretching of the perineum may reduce sudden mechanical stress on the tissues and therefore be associated with lower levels of perineal trauma (Heim & Makuch, 2023).

The findings of this study are consistent with the randomized controlled trial conducted by Zahra Ahmadi et al. (2017), which reported that controlled breathing techniques during labor were associated with reduced perineal damage compared with conventional pushing methods. In that randomized clinical trial, mothers who used a blowing breathing technique experienced a lower

degree of perineal trauma and improved maternal comfort during the second stage of labor. However, the methodological differences between the two studies should be noted. The study by Ahmadi et al. used a randomized controlled trial design, which allows stronger control of confounding variables, whereas the present study used a quasi-experimental design with a relatively small sample size. Therefore, although the direction of the findings is similar, the strength of the conclusions should be interpreted cautiously.

Several additional factors may also influence the occurrence of perineal tears during childbirth. These include the duration of the second stage of labor, maternal delivery position, fetal head circumference, and the elasticity of perineal tissues. For example, prolonged second-stage labor may increase strain on the perineum, while certain delivery positions may reduce pressure on the pelvic floor muscles (Darwis & Ristica, 2022). These factors were not specifically controlled in the present study and may have contributed to the differences observed between groups.

Another consideration is the potential for observer bias. The assessment of perineal tear degree was performed by healthcare personnel involved in the delivery process. Although standardized clinical classifications exist for grading perineal tears, differences in clinical judgment may occur when determining the exact degree of tissue damage. This possibility should be considered when interpreting the findings of the study.

Despite these limitations, this study provides preliminary evidence suggesting that differences in maternal pushing techniques may be associated with different patterns of perineal outcomes during vaginal delivery. The large effect size observed in the statistical analysis indicates that the difference between groups was substantial within the study sample. However, the findings should be interpreted as an association rather than definitive evidence of causation.

Future research using randomized controlled trial designs with larger sample sizes is recommended to further examine the relationship between maternal pushing techniques and perineal trauma. Additional variables such as duration of the second stage of labor, delivery position, episiotomy practices, and fetal head circumference should also be considered to provide a more comprehensive understanding of factors influencing perineal outcomes during childbirth.

LIMITATION OF THE STUDY

This study has several limitations. The sample size was relatively small, which may limit the generalizability of the findings. In addition, several potential confounding factors such as delivery position, duration of the second stage of labor, and episiotomy procedures were not controlled.

Future studies with larger sample sizes and randomized controlled designs are recommended.

CONCLUSIONS AND SUGGESTIONS

There is a significant difference in the incidence of perineal tears between the Valsalva pushing technique and the blow-blow pushing technique. The blow-blow pushing technique is more effective in reducing the risk of perineal tears during childbirth. Training midwives and pregnant women on proper breathing techniques during labor may improve maternal outcomes.

Acknowledgment

The authors would like to thank the Director of Akademi Kebidanan Harapan Bunda Bima and the West Dompu Community Health Center for supporting this research.

ETHICAL CONSIDERATIONS

This study received ethical approval from the Ethics Committee of STIKES Banyuwangi. Written informed consent was obtained from all participants before data collection.

Funding Statement.

- This research received partial financial support from LLDIKTI Region VIII under Grant Agreement No.129/C3/DT.05.00/PL/2025.

REFERENCES

- Ahmadi, Z., Torkzahrani, S., Roosta, F., Shakeri, N., & Mhmoodi, Z. (2017). Effect of breathing technique of blowing on the extent of damage to the perineum at the moment of delivery: A randomized clinical trial. *Iranian Journal of Nursing and Midwifery Research*, 22(1), 62–66. <https://doi.org/10.4103/1735-9066.202071>
- Ashri, R. H. (2024). Faktor-faktor yang mempengaruhi terjadinya robekan jalan lahir pada ibu bersalin di klinik alyssa medika periode tahun 2023. *Midwife Care Journal*, 1, 13–21. <https://ejournal.univbhaktiasih.ac.id/index.php/micare/article/view/14/4>
- Bahar, N. (2024). *Hubungan Teknik Meneran Yang Benar Dengan Kelancaran Persalinan Kala II pada Ibu Primigravida*. 9(1), 17–23. <https://doi.org/10.33867/jaia.v9i1.471>
- Barus, E. S., Liesmayani, E. E., & Novmaren, C. (2024). Efektivitas Teknik Meneran Terhadap Robekan Perineum Pada Ibu Inpartu Primigravida. *Jurnal Bidan Mandiri*, 2(1), 15–19.
- Darmayanti, R., Ariani, N. K. S., Darmawati, I. D. A. A., Wiarsini, K. A., & Nugraha, I. S. (2024). Edukasi Kesehatan Dan Pelatihan Perineal Massage Pada Ibu Bersalin Dan Tenaga Kesehatan Di UPTD Puskesmas Sukawati I Gianyar. *Jurnal Abdimas ITEKES Bali*, 3(2), 133–142.
- Darwis, D. G., & Ristica, O. D. (2022). Posisi Meneran Pada Ibu Bersalin Untuk Memperlancar Proses Kala II Persalinan. *Jurnal Kebidanan Terkini (Current Midwifery Journal)*, 2(1), 69–75. <https://doi.org/10.25311/jkt/vol2.iss1.581>
- Dinas Kesehatan Dompu. (2025). *Angka Kematian Ibu dan Bayi*.
- Elisa, Siti, N. E., & Sri, Y. (2016). Hubungan Paritas Dengan Terjadinya Robekan Perineum Spontan Pada Persalinan Normal. *Midwife Journal*, 2(2), 20–30. <https://doi.org/10.1136/bmj.304.6835.1170>
- Fatimah, & Lestari, P. (2019). *Pijat Perineum Mengurangi Ruptur Perineum untuk Kalangan Umum, Ibu Hamil, dan Mahasiswa Kesehatan*. Pustaka Baru Press. <https://doi.org/10.62335/sinergi.v2i4.1132>
- Giri, & Adi, S. (2022). *Modul Standar Operasional Keterampilan Keperawatan*. Lembaga Omega Medika. <http://repository.itskesicme.ac.id/id/eprint/6459>
- Heim, M. A., & Makuch, M. Y. (2023). Breathing Techniques During Labor: A Multinational Narrative Review of Efficacy. *The Journal of Perinatal Education*, 32(1), 23–34. <https://doi.org/https://doi.org/10.1891/jpe-2021-0029>
- Heriani, & Indra Sulistiawati. (2025). Faktor-Faktor Yang Berhubungan Dengan Kejadian Robekan Perineum Pada Persalinan Normal di PMB Roslina Kabupaten Ogan Komering Ulu Tahun 2023. *Jurnal Ilmiah Kedokteran Dan Kesehatan*, 4(3), 380–393. <https://doi.org/10.55606/klinik.v4i3.4746>

- Ida Fitriani. (2023). Pengaruh Teknik Relaksasi Bernafas Terhadap Tingkat Nyeri pada Inpartu Kala I. *Journal Stikes Hamzar*, 90.
- Indah, Firdayanti, & Nadyah. (2019). Manajemen Asuhan Kebidanan Intranatal Pada Ny “N” dengan Usia Kehamilan Preterm di RSUD Syekh Yusuf Gowa. *Jurnal Midwifery*, 1(1), 1–14. <https://doi.org/10.24252/jmw.v1i1.7531>
- Iqmy, L. O., & Minhayati, D. (2019). Senam Kegel Terhadap Ruptur Perineum Pada Ibu Bersalin. *Jurnal Kebidanan*, 5(2), 193–198. <https://doi.org/10.30633/jkms.v10i1.307>
- Kemenkes RI. (2022). *Teknik NonFarmakologi; Menarik Napas Dalam Untuk Mengurangi Nyeri*.
- Legawati. (2019). *Asuhan Persalinan dan Bayi Baru Lahir*. Wineka Media.
- Maftukha, A., & Suparmi. (2024). Perbedaan Kejadian Laserasi Perineum Pada Ibu Bersalin Antara Teknik Meneran Tiup Dan Valsava Di Wilayah Kerja Puskesmas Pandu Sanjaya Kalimantan Tengah. *Jurnal Ilmu Kesehatan*, 5(5), 25–31. <https://doi.org/10.5455/mnj.v1i2.644xa>
- Mar’atussaliha, Nurdalifah, Nata, S. A., & Hibrisdayanti. (2024). Gambaran Faktor-Faktor Penyebab Ruptur Perineum Pada Persalinan Normal Di RSUD Batara Siang Kab.Pangkep Tahun 2023. *Jurnal Ilmiah Kesehatan Diagnosis*, 19(3), 41–48.
- Mutmainnah, U. (2021). *Asuhan Persalinan Normal & Bayi Baru Lahir*. Penerbit NEM.
- Pertiwi, R., Handayani, I. F., Fariji, A. A., & Makhrus, I. (2022). Pemberdayaan Masyarakat Melalui Pelatihan Teknik Meneran “Tiup” Terhadap Bidan, Kader Dan Ibu Hamil Di Wilayah Karawang Barat Kabupaten Karawang. *Jurnal Pengabdian Masyarakat Kesehatan Indonesia*, 1(1), 64–71. <https://doi.org/10.34011/jpmki.v1i1.985>
- Putri, S. R., Rositawati, & Nurzakayah, W. S. (2024). Pengaruh Senam Kegel Terhadap Laserasi Perineum Ibu Bersalin Yang Telah Melakukan Senam Kegel Saat Hamil Di Rsud Cimacan Periode September-Februari 2024. *Journal Of Midwifery*, 12(1), 111–115. <https://doi.org/10.37676/jm.v12i1.6208>
- Riyanti, N., Devita, R., & Huwaida, N. (2023). Faktor-Faktor Yang Berhubungan Dengan Kejadian Ruptur Perineum Pada Persalinan Normal. *Jurnal 'Aisyiyah Palembang*, 8(1), 127–135. <https://doi.org/10.52524/midwiferyhealthjournal.v7i2.130>
- Sinuhaji, F., Suryantara, B., & Kristiarini, J. J. (2024). Efektivitas Pijat Perineum Dan Posisi Meneran Dalam Mencegah Ruptur Perineum Pada Ibu Bersalin. *Joernal Of Health Research*, 7(2), 17–30. <https://doi.org/10.25130/sc.24.1.6>
- Supiani, & Yusuf Nurlathifah N. (2023). Penerapan Senam Kehamilan Untuk Mencegah Robekan Perineum Pada Ibu Hamil di Puskesmas Selong. *Jurnal Pengabdian Masyarakat Jajama (JPMJ)*, 2(2), 88. <https://doi.org/10.47218/jpmj.v2i2.290>
- Tria, N. H., & Anisah, T. M. (2024). Faktor-Faktor Yang Berhubungan Dengan Robekan Jalan Lahir Pada Ibu Bersalin. *Jurnal Ilmiah Kesehatan*, 3(7), 294–301.
- World Health Organization. (2023). *Maternal mortality: Key facts*. <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>

