EFFICACY OF A COMBINED PLANTAIN LEAF (PLANTAGO MAJOR L.,) AND TURMERIC RHIZOME (CURCUMA LONGA L.,) FOR REDUCING PERINEAL WOUND PAIN IN POSTPARTUM

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ABSTRACT

Background**:** Globally, approximately 70–90% of vaginal deliveries result in perineal wounds. Perineal wounds are commonly associated with pain that interferes with daily activities, thereby negatively affecting the quality of life of postpartum mothers. Effective management of perineal wounds is essential to prevent complications and promote optimal healing. Traditional medicine utilizing natural ingredients, such as *Plantago Major L.*,and curcuma Longa L, has shown potential in relieving pain, wound healing perineal. Providing comfort and satisfaction to postpartum women is an essential responsibility of midwives. Objectives: To analyze the effect of a combined compress intervention using *Plantago Major L* and Curcuma Longa L on perineal wound pain in postpartum mothers. Methods: A quasi-experimental study with a pre-test and post-test control group design was conducted to compare the mean perineal wound pain scores between the treatment and control groups. Results: There was a significant reduction in perineal pain intensity among postpartum women treated with a combined plantain leaves and turmeric rhizome compress compared to those receiving Boiled water that has been cooled ($p = 0.006$; $p < 0.05$. Conclusions: The combination of *Plantago Major L* and Curcuma Longa L has a significant effect on reducing pain levels in postpartum mothers with perineal wounds.

Keywords : Plantain Leaf (Plantago major L.,); Turmeric Rhizome (Curcuma longa L.); perineal pain; postpartum mothers

INTRODUCTION

Perineal trauma is a common complication of vaginal delivery, affecting approximately 9 out of 10 women. The incidence of second-degree perineal tears among primiparous women is around 40%. Such injuries may result in chronic pain, urinary and fecal incontinence, dyspareunia, and sexual dysfunction.(Arnold & Services, 2021);(Okeahialam et al., 2024). Clinical data indicate that 70–80% of women experience acute or persistent pain after childbirth, including perineal wound pain, uterine contractions, breast pain, incision pain, lower back pain, and pelvic pain (Zhou et al., 2025). Postpartum perineal pain is a common condition that can have both physical and emotional impacts. There is an association between the type and degree of perineal tears and the level of pain experienced by postpartum women. (Zhou et al., 2025)

Perineal trauma not only causes acute pain during the postpartum period but also disrupts maternal recovery, maternal functioning, daily activities, infant care, and overall maternal well-being. Such limitations in daily functioning may negatively influence maternal practices both physically and psychologically. (Yamada et al., 2024);(Cai et al., 2025). A study by Yamada et al. (2024) in Japan reported that excessive gestational weight gain above the recommended range was positively and significantly associated with perineal pain on the first postpartum day, in addition to other factors such as maternal age, episiotomy, use of analgesics, and neonatal birth weight. (Yamada et al., 2024). Risk factors for impaired perineal wound healing include primiparity, episiotomy, perineal lacerations combined with episiotomy, and vaginal hematoma, all of which are independent predictors of perineal wound healing complications following vaginal delivery. (Cai et al., 2025).

Conversely, recent systematic reviews have reported that postpartum perineal pain management remains predominantly dependent on pharmacological approaches, including acetaminophen, nonsteroidal anti-inflammatory drugs (NSAIDs), and cold compress therapy. (Luxey et al., n.d.);(Abalos et al., 2021);(Wuytack et al., 2021);(Ce et al., 2020). One natural ingredient with potential therapeutic use is *Plantago major* (plantain leaf). This plant has long been recognized as a medicinal herb and contains bioactive compounds associated with anti-inflammatory, antimicrobial, analgesic, and wound-healing activities. Clinical studies in nulliparous women with episiotomy wounds have shown that *Plantago major* can accelerate pain reduction and wound healing compared to placebo. These findings suggest that *Plantago major* has potential as an adjunct therapy for perineal wounds. (Samuelsen, 2020);(Zhakipbekov et al.,

2023). Findings from Ashkani-Esfahani et al. (2019) using a rat model showed that a combination of *Plantago major* and *Aloe vera* significantly promoted wound healing through increased fibroblast proliferation, collagen synthesis, and revascularization of skin injuries. The biological activities of *Plantago major*, particularly its anti-inflammatory and antioxidant effects, play an important role in supporting the wound healing process**.** (Ashkani-esfahani et al., 2019)

METHOD

The research design study employed a quasi-experimental pre-test–post-test control group design to evaluate the effect of a combined plantain leaf (*Plantago major*) and turmeric rhizome (*Curcuma longa*) decoction on perineal wound pain among postpartum mothers.

The study population consisted of postpartum mothers with perineal wounds. A total of 34 participants were included, comprising 17 respondents in the treatment group and 17 in the control group. The inclusion criteria were postpartum mothers who were willing to participate and had grade 1–2 perineal wounds resulting from either episiotomy or spontaneous rupture. The exclusion criteria included postpartum mothers who were unwilling to participate, were at risk of infection or bleeding, exhibited hypersensitivity reactions to plantain leaves or turmeric rhizome, or had a body temperature above 37.5°C. The independent variable in this study was the intervention consisting of a decoction of combined plantain leaves (*Plantago major*) and turmeric rhizome (*Curcuma longa*). The dependent variable was perineal wound pain, measured using the Numeric Rating Scale (NRS). Respondent characteristics included maternal age, parity, occupation, and type of perineal wound.

North Tapanuli Regency served as the study setting, where the research was conducted at five community health centers (Puskesmas)—Hutabaginda, Siatas Barita, Siborong-borong, Sitada-data, and Onan Hasang—from June to September 2025.

Data were collected using a structured observation sheet to document the administration of the intervention, which consisted of a combination of plantain leaves (*Plantago major*) and turmeric rhizome (*Curcuma longa*), prepared with boiled and cooled water. The observation sheet was used to ensure consistency and accuracy in the implementation of the intervention.

Perineal wound pain was measured using the Numeric Rating Scale (NRS) at baseline (pre-test) and after the intervention (post-test). The wound healing process was also monitored and systematically recorded using the observation sheet throughout the study period.

The intervention was prepared in the form of a combination of plantain leaf infusion and turmeric rhizome decoction. Preparation of Plantain Leaf Infusion : Fresh or dried healthy plantain leaves were selected and thoroughly washed. A total of 10 g of plantain leaves were finely chopped and

placed into an infusion pot, followed by the addition of 100 mL of clean water. The mixture was heated over an open flame at approximately 90°C for 15 minutes. After heating, the infusion was strained through a flannel cloth while still warm, and the residue was discarded. If the final volume was less than 100 mL, additional hot water was poured through the residue to obtain the required volume. Preparation of Turmeric Rhizome:Fresh turmeric rhizomes were selected, thoroughly washed, and finely chopped to obtain 10 g. The prepared rhizome was placed into an infusion pot with 100 mL of water. The mixture was heated over an open flame for 30 minutes, starting from when the temperature reached 100°C. After heating, the decoction was strained through a flannel cloth while still warm, and the residue was discarded. If the final volume was less than 100 mL, additional hot water was added through the residue to achieve the required volume. Combination of the Preparations: The plantain leaf infusion and turmeric rhizome decoction were then mixed thoroughly to obtain a homogeneous solution, which was used as the intervention. The intervention was administered for six consecutive days. Participants in the treatment group applied the filtered decoction of plantain leaves (*Plantago major*) and turmeric rhizome (*Curcuma longa*) to cleanse the perineal wound 2–3 times daily at regular intervals until wound healing was achieved. Experimental Procedure: Participants in the control group performed perineal wound care three times daily using boiled and cooled water until complete healing was observed.

In cases of allergic reactions or irritation, the intervention was discontinued immediately, and participants were advised to consult healthcare professionals.

Data were analyzed using descriptive and inferential statistics. Differences in perineal wound pain before and after the intervention were analyzed using a paired *t*-test or Wilcoxon test, while differences between the treatment and control groups were analyzed using an independent *t*-test or Mann–Whitney *U* test, with a significance level of $p < 0.05$.

RESULTS AND DISCUSSION

Based on age, the majority of respondents in the treatment group were aged 25–35 years (76.5%), while in the control group, most respondents were aged years < 25 Thn > 35 Thn

(82.4%). This indicates that the treatment group was predominantly within the optimal reproductive age range, whereas the control group had a higher proportion of respondents outside this range.

In terms of parity, respondents in the treatment group were mostly multiparous (> 2) (52.9%), while the control group was slightly dominated by respondents with parity of 1–2 (52.9%). However, the distribution of parity between the two groups was relatively balanced.

Regarding occupation, the majority of respondents in both groups were unemployed/housewives, accounting for 70.6% in the treatment group and 64.7% in the control group. Only a smaller proportion of respondents were employed, with 29.4% in the treatment group and 35.3% in the control grouf. The respondent characteristics can be seen in Table 1.

Table 1. Respondent Characteristics by Treatment and Control Groups (n = 34)

Characteristics	Kelompok	
	Treatment	Control
	n=17%	n= 17%
Age		
a. < 25 Thn > 35 Thn	4 (23,5%)	12 (70,6%)
b. 25-35 Thn	13 (76,5%)	5 (29,4%)
Parity		
a. 1-2	8 (47,1%)	9 (52,9%)
b. > 2	9 (52,9%)	8 (47,1%)
Occupation		
a. Employed	5 (29.4%)	6 (35.3%)
b. Unemployed	12 (70.6%)	11 (64.7%)

Table 2. Distribution of Perineal Wound Pain Levels Before and After Intervention

Characteristics	Grou							
	Control				Treatment			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
Pain Level								
a. Mild	6	35,3	12	70,6	4	23,5	15	88,2
b. Severe	11	64,7	5	29,4	13	76,5	2	11,8
Total	**17**	**100**	**17**	**100**	**17**	**100**	**17**	**100**

The distribution of perineal wound pain levels showed improvement in both groups after the intervention. In the control group, the proportion of respondents with mild pain increased from 35.3% at pre-test to 70.6% at post-test, while severe pain decreased from 64.7% to 29.4%.

In the treatment group, a more pronounced improvement was observed. The proportion of respondents with mild pain increased from 23.5% at pre-test to 88.2% at post-test, while severe pain decreased substantially from 76.5% to 11.8%.

These findings indicate that the reduction in perineal wound pain was greater in the treatment group compared to the control group.

Tabel 3 Normality Test of Perineal Wound Pain (*Shapiro-Wilk*)

Grouf	Shapiro-Willk		
	Statistik	**df**	**Sig.**
Pain	**.370**	**34**	**< 0,001**

*Shapiro–Wilk test; significance level p < 0.05

The Shapiro–Wilk normality test showed a significance value of < 0.001 (p < 0.05), indicating that the perineal wound pain data were not normally distributed.

Tabel 4 Comparison of Perineal Wound Pain Scores Between Treatment and Control Groups

Variable	Treatment (n = 17)	Control (n = 17)	p-value*
Pain Score	230.00 (220.00–240.00)	365.00 (350.00–380.00)	0.006

**Levelsignificance <0,05*

Based on the Mann–Whitney U test, a p-value of 0.006 (p < 0.05) was obtained, indicating a statistically significant difference between the treatment and control groups.

This finding suggests that the intervention using a combination compress of plantain leaves (*Plantago major L.*) and turmeric rhizome (*Curcuma longa L.*) was more effective in reducing perineal wound pain among postpartum mothers compared to the control group.

DISCUSSION

This study demonstrates that the use of a combined *Plantago major* and *Curcuma longa* compress has a significant effect on reducing perineal wound pain among postpartum mothers. Physiologically, the wound healing process consists of the inflammatory, proliferative, and remodeling phases. During the inflammatory phase, *Plantago major* (plantain leaf) plays an important role through its bioactive compounds, including flavonoids, aucubin, and phenolic compounds, which exhibit anti-inflammatory and antibacterial effects. Studies have shown that *Plantago major* extract can reduce erythema, accelerate wound closure, and significantly increase the percentage of wound healing compared to control group. (Ghanadian et al., 2024). The combination of *Plantago major* and *Curcuma longa* exerts synergistic effects across all phases of wound healing by reducing inflammation, enhancing angiogenesis and collagen synthesis, and promoting tissue regeneration, supported by evidence highlighting the regulatory role of flavonoids in wound healing pathways

During the proliferative phase, *Curcuma longa* (turmeric rhizome) plays a crucial role through its active compound, curcumin, which exhibits strong antioxidant and anti-inflammatory properties. Curcumin has been shown to enhance fibroblast proliferation, collagen synthesis, and angiogenesis, thereby accelerating new tissue formation. Studies on perineal wounds indicate that the use of turmeric infusion can promote faster wound healing, reduce edema and erythema, and accelerate wound closure compared to standard care. (Ode et al., 2021).

In the remodeling phase, the combined use of these two agents enhances scar quality by promoting collagen deposition and improving tissue elasticity. These effects are crucial in preventing complications such as wound dehiscence and secondary infections. Previous evidence indicates that increased fibroblast density and collagen synthesis are critical determinants of successful wound healing. (Ashkani-esfahani et al., 2019).

In relation to wound healing theory, the combination of *Plantago major* and *Curcuma longa* acts synergistically across all phases of healing. During the inflammatory phase, both agents suppress the inflammatory response, thereby reducing pain. In the proliferative phase, active compounds such as flavonoids and curcumin enhance angiogenesis and collagen synthesis, which accelerates tissue regeneration. This is supported by recent studies indicating that flavonoids play a crucial role in modulating wound healing pathways and tissue regeneration(Zulkefli et al., 2023). In relation to wound healing theory, the combination of *Plantago major* and *Curcuma longa* acts synergistically across all phases of the healing process. During the inflammatory phase, both agents suppress the inflammatory response, thereby reducing pain. In the proliferative phase, active compounds such as flavonoids and curcumin enhance angiogenesis and collagen synthesis, which accelerates tissue regeneration. This is supported by recent studies indicating that flavonoids play a crucial role in modulating wound healing pathways and promoting tissue regeneration.(Mohaghegh et al., 2022).

The findings of this study are consistent with those of Khusniyati et al. (2023), who reported that non-pharmacological interventions are effective in reducing perineal wound pain in postpartum

women and that combining multiple therapies yields more optimal outcomes than single interventions. Biologically, these effects can be explained by the presence of flavonoids in *Plantago major* and curcumin in *Curcuma longa*, which exhibit anti-inflammatory and analgesic activities, particularly through the inhibition of pain mediators such as prostaglandins, thereby contributing to a more rapid reduction in pain intensity among postpartum women.(Khusniyati & Purwati, n.d.)

CONCLUSION

The combination compress of plantain leaves (*Plantago major L.*) and turmeric rhizome (*Curcuma longa L.*) has been shown to be effective in reducing perineal wound pain among postpartum mothers. This intervention may be considered a safe, cost-effective, and non-pharmacological alternative for perineal wound care.

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REFERENCES

Abalos, E., Sguassero, Y., & Gml, G. (2021). *Paracetamol/acetaminophen (single administration) for perineal pain in the early postpartum period (Review)*. https://doi.org/10.1002/14651858.CD008407.pub3.www.cochranelibrary.com

Arnold, M. J., & Services, U. (2021). *Obstetric Lacerations : Prevention and Repair*. 745–752.

Ashkani-esfahani, S., Khoshneviszadeh, M., Noorafshan, A., & Miri, R. (2019). *The Healing Effect of Plantago Major and Aloe Vera Mixture in Excisional Full Thickness Skin Wounds : Stereological Study*. https://doi.org/10.29252/wjps.8.1.51.www.wjps.ir

Cai, C., Shan, S., Chen, X., Yao, X., & Liu, Y. (2025). International Journal of Nursing Studies Advances Analysis of risk factors and prediction model construction for poor healing of perineal wounds after vaginal delivery : A retrospective case-control study. *International Journal of Nursing Studies Advances*, *8*(April), 100326. https://doi.org/10.1016/j.ijnsa.2025.100326

Ce, E., Edf, D., & Re, W. (2020). *Local cooling for relieving pain from perineal trauma sustained during childbirth (Review)*. https://doi.org/10.1002/14651858.CD006304.pub4.www.cochranelibrary.com

Ghanadian, M., Soltani, R., Homayouni, A., Khorvash, F., & Jouabadi, S. M. (2024). *The Effect of Plantago major Hydroalcoholic Extract on the Healing of Diabetic Foot and Pressure Ulcers : A Randomized Open-Label Controlled Clinical Trial*. https://doi.org/10.1177/15347346211070723

Khusniyati, E., & Purwati, H. (n.d.). *Effectiveness of Non-Pharmacological Intervention to Reduce Perineal Pain In Postpartum Women*. *2*(2), 667–679.

Luxey, X., Lemoine, A., Dewinter, G., Joshi, G. P., Ray, C. Le, Raeder, J., & Velde, M. Van De. (n.d.). *Acute pain management after vaginal delivery with perineal tears or episiotomy*. 1–11. https://doi.org/10.1136/rapm-2024-105478

Mohaghegh, Z., Golfakhrabadi, F., & Siahkal, S. F. (2022). *Original Article The Effect of Malva Sylvestris Cream on Episiotomy Pain and Healing : A Randomized Controlled Clinical Trial*. *10*(4), 248–258. https://doi.org/10.30476/IJCBNM.2022.95772.2082.Copyright

Ode, W., Mutia, N., Nilawati, A., Jaqin, N., Rahman, L., & Ahmad, M. (2021). Potency of complemeter therapy to the healing process of perineal wound ; turmeric (Curcuma longa Linn) Infusa ಔ. *Gaceta Sanitaria*, *35*, S322–S326. https://doi.org/10.1016/j.gaceta.2021.10.045

Okeahialam, N. A., Sultan, A. H., & Thakar, R. (2024). Expert Review The prevention of perineal trauma during vaginal birth. *The American Journal of Obstetrics & Gynecology*, *230*(3), S991–S1004. https://doi.org/10.1016/j.ajog.2022.06.021

Samuelsen, A. B. (2020). *The traditional uses , chemical constituents and biological activities*

of Plantago major L . A review. *January*.

Wuytack, F., Smith, V., Bj, C., Wuytack, F., Smith, V., & Bj, C. (2021). *Oral non-steroidal anti-inflammatory drugs (single dose) for perineal pain in the early postpartum period (Review)*. https://doi.org/10.1002/14651858.CD011352.pub3.www.cochranelibrary.com

Yamada, A., Takahashi, Y., Hirose, M., Usami, Y., Maruya, S., & Tamakoshi, K. (2024). *Factors associated with perineal pain on the first postnatal day after vaginal delivery : a cross-sectional study of primiparous women*. 52–63. https://doi.org/10.18999/nagjms.86.1.52

Zhakipbekov, K., Turgumbayeva, A., Issayeva, R., Kipchakbayeva, A., Kadyrbayeva, G., Tleubayeva, M., Akhayeva, T., Tastambek, K., Sainova, G., Serikbayeva, E., Tolenova, K., Makhatova, B., Anarbayeva, R., Shimirova, Z., & Tileuberdi, Y. (2023). *Antimicrobial and Other Biomedical Properties of Extracts from*. 1–21.

Zhou, L., Li, J., Zhou, Y., Liang, Y., Ma, Q., Yang, L., & Pang, Y. (2025). *Pain Management for Postpartum Pain : A Narrative Review*. *October*, 5617–5626.

Zulkefli, N., Nur, C., Che, M., Sayuti, N. H., Kamarudin, A. A., Saad, N., Hamezah, H. S., Bunawan, H., & Baharum, S. N. (2023). *Flavonoids as Potential Wound-Healing Molecules : Emphasis on Pathways Perspective*.