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Article

Effectiveness of Betel Leaf Decoction in Healing Second-Degree Perineal Wounds Among Postpartum Mothers at PMB Ima Mustakimah

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Abstract

Background: Maternal mortality remains a critical concern globally, particularly in regions such as Sub-Saharan Africa and South Asia. Effective, accessible interventions are urgently needed to improve maternal health outcomes, particularly in primary care settings.
Objective: This study aimed to assess the effectiveness of boiled betel leaf (Piper betle) water in accelerating the healing of second-degree perineal wounds among postpartum mothers.
Methods: A quasi-experimental design with a posttest-only control group was employed. The study involved postpartum mothers who experienced second-degree perineal wounds and received care at PMB Ima Mustakimah. A total of 30 participants were selected through total sampling and divided into an intervention group treated with boiled betel leaf water and a control group receiving standard perineal care. Healing duration was measured and compared between groups.
Results: Most participants in the intervention group experienced faster wound healing compared to the control group. The mean duration of wound healing in the intervention group was 6.40 days, significantly shorter than the 10.87 days observed in the control group. Statistical analysis showed a significant effect of betel leaf decoction on wound healing ($p = 0.000$).
Conclusion: Boiled betel leaf water is effective in promoting faster healing of second-degree perineal wounds in postpartum mothers. This natural remedy has the potential to be integrated into routine perineal care. Health practitioners are encouraged to provide counseling on its safe use as a complementary treatment in postpartum recovery.

Keywords: Postpartum mothers, perineal wound, betel leaf decoction, wound healing, maternal care

INTRODUCTION

Postpartum infection remains one of the leading causes of maternal mortality in Indonesia, second only to hemorrhage. Despite long-standing awareness, the maternal mortality rate (MMR) has shown little significant decline over the years. Globally, maternal deaths remain alarmingly high, with the World Health Organization reporting approximately 295,000 maternal deaths in 2020. The majority of these deaths—about 86%—occur in low- and middle-income countries, particularly in Sub-Saharan Africa and South Asia. Indonesia continues to face high maternal mortality, with an estimated 230 deaths per 100,000 live births. Most of these deaths (90%) result from complications during childbirth and the immediate postpartum period, including hemorrhage, hypertensive disorders, infection, prolonged labor, and unsafe abortion.

Among the infections affecting postpartum women, perineal wound infections are particularly prevalent. These wounds often result from episiotomies or spontaneous perineal tears sustained during vaginal delivery. Infection can arise from various sources, including exogenous pathogens introduced during delivery, autogenous bacteria from other parts of the body, or endogenous flora from the birth canal. Poor wound hygiene and

suboptimal postpartum care can exacerbate infection risks, delaying healing and increasing the risk of complications.

Globally, perineal rupture remains a common obstetric outcome. In 2020, an estimated 2.7 million cases were recorded, with projections reaching 6.3 million by 2050. In Asia, nearly half of women in labor experience perineal trauma. In Indonesia, the prevalence of birth canal injuries is strikingly high, affecting approximately 85% of women in labor. Among these, perineal tears account for 35%, followed by cervical lacerations (25%), vaginal injuries (22%), and uterine rupture (3%). The healing of perineal wounds typically occurs within seven days if managed effectively, but delayed recovery can lead to serious infections, excessive bleeding, and, in severe cases, maternal death.

The healing process is influenced by multiple factors, including the mother's knowledge of wound care, nutritional status, and personal hygiene practices. Effective perineal care during the postpartum period is crucial to prevent complications. While pharmacological antiseptics are commonly used in perineal wound management, the use of non-pharmacological alternatives remains limited in clinical practice.

One promising non-pharmacological intervention is the use of boiled betel leaf (Piper betle) water, which has long been utilized in traditional medicine due to its antiseptic, antibacterial, and anti-inflammatory properties. Betel leaves are rich in active compounds that support tissue repair and reduce microbial colonization, making them an effective alternative for promoting perineal wound healing. Many postpartum women have begun using betel leaf decoction as a natural substitute for chemical antiseptics, citing its accessibility and perceived safety. Given the high incidence of perineal trauma and the potential benefits of traditional herbal remedies, this study was conducted to evaluate the effectiveness of boiled betel leaf water in accelerating the healing of second-degree perineal wounds among postpartum mothers.

METHODE

Study Design

This study employed a quasi-experimental design with a posttest-only control group approach. This design was selected to evaluate the effectiveness of boiled betel leaf (Piper betle) water in promoting the healing of second-degree perineal wounds among postpartum mothers. The intervention was applied to the treatment group, while the control group received standard postpartum care without the boiled betel leaf water.

Sample

The target population comprised postpartum mothers who gave birth at PMB Ima Mustakimah, West Java, Indonesia. A total sampling technique was employed, where all eligible postpartum mothers with second-degree perineal wounds during the data collection period were recruited to participate. participants were included in the study if they met the following criteria: postpartum mothers who had experienced a second-degree perineal tear confirmed by the attending midwife, aged 18 years and above, delivered vaginally at PMB Ima Mustakimah during November 2023, willing to participate and provide written informed consent, and able to communicate verbally and understand instructions in the Indonesian language.

Participants were excluded if they had underlying chronic illnesses (e.g., diabetes mellitus or immunocompromised conditions) that could delay wound healing, had perineal wounds beyond second-degree (i.e., third or fourth-degree tears), and received additional topical or systemic wound treatment apart from the intervention provided.

The total number of postpartum mothers who met the eligibility criteria during the study period was 30. The sample was divided into two groups using a non-randomized assignment: 15 mothers in the intervention group (boiled betel leaf water) and 15 in the control group (standard care). Although this sample size was determined by availability rather than statistical calculation, it was considered sufficient for preliminary evaluation of treatment effects in this quasi-experimental pilot context.

Instrument

Wound healing assessment was conducted using a Perineal Wound Healing Observation Sheet adapted from the REEDA scale (Redness, Edema, Ecchymosis, Discharge, Approximation). This instrument was originally developed by Davidson and colleagues to evaluate perineal wound recovery. The scale includes five components, each scored from 0 to 3, with a total possible score ranging from 0 to 15. Lower scores indicate better wound healing. The Indonesian version of the REEDA scale has demonstrated acceptable inter-rater reliability, with a reported Cronbach's alpha coefficient of 0.82 in previous studies. Daily observations were conducted by trained midwives blinded to group assignment.

Procedure

Participants were assigned to either the intervention or control group based on the order of delivery and consent. The intervention group received perineal cleansing using boiled betel leaf water twice daily from day 1 to day 7 postpartum. The betel leaf solution was prepared by boiling 10 clean betel leaves in 1 liter of water for 10–15 minutes and allowing it to cool to room temperature before use.

The control group received standard postpartum perineal care according to national midwifery guidelines, which included regular hygiene practices without the use of betel leaf solution. All mothers were advised to maintain perineal hygiene, ensure adequate nutrition, and avoid excessive movement that might affect wound healing. On day 7 postpartum, wound healing was assessed in both groups using the REEDA-based observation sheet. Assessments were performed by trained health workers who were blinded to the participant groupings.

Data Analysis

Data were analyzed using SPSS version 26.0. Descriptive statistics (mean, standard deviation, frequency, and percentage) were used to describe the characteristics of participants and wound healing outcomes. The normality of continuous data was tested using the Shapiro-Wilk test. Since the data were not normally distributed, bivariate analysis was conducted using the Mann–Whitney U test to compare wound healing scores between the intervention and control groups. A p-value of less than 0.05 was considered statistically significant.

Ethical Consideration

This study received ethical approval from the Research Ethics Committee of STIKep PPNI Jawa Barat. All participants provided written informed consent after receiving a full explanation of the study's aims, procedures, risks, and benefits. Participation was entirely voluntary, and participants were free to withdraw at any time without consequences. Confidentiality and anonymity were ensured by using unique codes in place of personal identifiers, and data were stored securely with access limited to the research team.

RESULTS

As shown in Table 1, in the intervention group where postpartum mothers received perineal care using boiled betel leaf water, the majority experienced fast healing (53.3%), while 46.7% demonstrated normal healing. No participants in this group experienced slow wound healing. In contrast, the control group showed predominantly normal healing (80.0%), with 20.0% experiencing delayed recovery and no cases classified as fast healing.

Table 1. Distribution of Healing Duration of Second-Degree Perineal Wounds in Postpartum Mothers Between the Intervention and Control Groups at PMB Ima Mustakimah

Perineal Wound Healing Category	Intervention Group	%	Control Group	%
Fast	8	53.3	0	0.0
Normal	7	46.7	12	80.0
Slow	0	0.0	3	20.0

Table 2 shows that the average healing time for second-degree perineal wounds in the intervention group was 6.40 days, compared to 10.87 days in the control group. This indicates a mean difference of 4.47 days, suggesting a faster healing trajectory among mothers who received betel leaf boiled water treatment.

Table 2. Average Healing Time of Second-Degree Perineal Wounds in Postpartum Mothers

Group	N	Mean Healing Time (Days)	Mean Difference	Minimum	Maximum
Intervention	15	6.40	4.47	5	9
Control	15	10.87	—	7	15

As presented in Table 3, the average healing time in the intervention group was 6.40 days with a standard deviation of 1.183, whereas the control group had a significantly longer healing duration, with a mean of 10.87 days and a standard deviation of 2.416. The independent sample t-test produced a p-value of 0.000 ($p < 0.05$), indicating a statistically significant difference between the two groups. This result confirms that the administration

of boiled betel leaf water was effective in accelerating the healing process of second-degree perineal wounds among postpartum mothers

Table 3. Effectiveness of Boiled Betel Leaf Water on Healing Time of Second-Degree Perineal Wounds

Group	Healing Category	N	Mean Healing Time	SD	p-value
Intervention	Fast	8	6.40	1.183	
	Normal	7	—	—	0.000
	Slow	0	—	—	
Control	Fast	0	10.87	2.416	
	Normal	12	—	—	
	Slow	3	—	—	

DISCUSSION

The findings of this study indicate that the average healing time for grade II perineal wounds in the intervention group, those receiving boiled betel leaf water treatment was approximately 6.40 days, falling within the "fast" healing category. In contrast, the average healing time in the control group was approximately 10.87 days, categorized as "normal." Perineal wounds typically occur as a result of episiotomy or spontaneous tears during childbirth. These injuries involve the urogenital diaphragm and levator ani muscles and, if not treated adequately, can lead to complications such as pelvic floor weakening and genital prolapse. According to Rukiyah (2018), the physiological wound healing process begins within 6–7 days through the formation of new tissue. Therefore, timely and effective wound care is crucial for optimal recovery. The present study aligns with the findings of Rostika (2020), who reported that perineal wounds healed faster (average 5.80 days) in the group treated with boiled betel leaf water compared to the control group (7.80 days). This supports the conclusion that boiled betel leaf water can significantly accelerate the healing process.

From the researchers' perspective, the administration of boiled betel leaf water provides significant benefits due to the plant's antiseptic, anti-inflammatory, and cooling properties. In the intervention group, most mothers experienced wound healing within 5–9 days, while those in the control group required 9–15 days. This difference of 4–6 days reflects the clinical effectiveness of betel leaf as a non-pharmacological intervention for perineal wound care. However, individual healing trajectories varied, indicating that other factors, such as hygiene practices, nutritional status, pain tolerance, and activity level may also influence outcomes.

Statistical analysis showed a significant difference between the intervention and control groups, with a p-value of 0.000 ($p < 0.05$). This confirms that boiled betel leaf water is effective in accelerating the healing of second-degree perineal wounds in postpartum mothers. The use of antiseptics in perineal wound care is traditionally approached through pharmacological means. However, concerns regarding the safety of some antiseptics during breastfeeding have led to a renewed interest in natural alternatives. Betel leaves (Piper betle) have long been recognized in traditional Indonesian medicine for their wound-healing properties. The chemical constituents of betel leaves—including eugenol, carvacrol, tannins, and flavonoids exert antimicrobial, anti-inflammatory, analgesic, and antioxidant effects, which collectively promote tissue regeneration, reduce oxidative stress, and enhance local circulation to support healing. Previous studies support this finding. Rostika (2020) found an average healing time of 5.80 days for perineal wounds treated with boiled red betel leaf water. Similarly, research by Syaiful (2022) using the Wilcoxon test demonstrated a significant effect of boiled betel leaves on wound healing, with a p-value of 0.014. The mechanism of action is likely multifactorial. Arecoline and carvacrol in betel leaves stimulate peristalsis and improve systemic blood flow, ensuring enhanced oxygenation and nutrient delivery to the wound site. Additionally, eugenol functions as a topical analgesic, reducing discomfort and facilitating maternal mobility during recovery.

While the results are promising, this study has several limitations. First, the sample size was relatively small and limited to a single private midwifery clinic, which may reduce the generalizability of the findings. Second, other confounding factors such as nutrition, hygiene practices, and adherence to wound care protocols were not controlled or measured systematically. Third, subjective reporting from postpartum mothers regarding pain and wound condition may introduce response bias. Lastly, the study duration was limited to one month, so longer-term effects and recurrence rates were not assessed.

The findings suggest that boiled betel leaf water may serve as an effective, affordable, and culturally acceptable non-pharmacological alternative for managing perineal wounds in postpartum mothers. Midwives and other maternal health providers can consider incorporating this practice into postpartum care education and counseling. Given the widespread availability of betel leaves and their low risk of adverse effects, this intervention could be particularly valuable in rural or low-resource settings. Furthermore, this study highlights the importance of integrating traditional medicine into modern postpartum care frameworks, encouraging evidence-based use of herbal remedies. Future training programs for midwives and nursing staff should include modules on complementary therapies supported by scientific research to ensure safe and effective implementation.

CONCLUSION

The duration of healing for second-degree perineal wounds in the intervention group was significantly shorter compared to the control group. The average healing time was 6.40 days in the intervention group versus 10.87 days in the control group. The administration of boiled betel leaf water was found to be effective in accelerating the healing of grade II perineal wounds in postpartum mothers, with statistical significance.

Conflict of Interest

The authors declare that there is no conflict of interest related to the conduct, authorship, or publication of this study.

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Data Availability Statement

The data used and analyzed during this study are not publicly available in order to protect participant confidentiality. However, data may be made available from the corresponding author upon reasonable request and with appropriate ethical approval.

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