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The Effect of Green Betel Leaf Water Bath on the Healing Time of Perineal Wounds in Postpartum Mothers in the Work Area of the Sikui Community Health Center

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Abstract. Perineal wounds are a common condition experienced by postpartum mothers after vaginal delivery and can potentially cause pain, discomfort, and the risk of infection if not properly cared for. Effective, safe, and culturally appropriate perineal wound care is a crucial need in postpartum care, especially at the primary health care level. Green betel leaves (Piper betle L.) are known to have antiseptic and anti-inflammatory properties that have the potential to support the wound healing process. This study aims to analyze the effect of green betel leaf water baths on the perineal wound healing process in postpartum mothers in the Sikui Community Health Center (UPT) work area. This study used a quantitative quasi-experimental design with a one-group pretest–posttest approach. The study was conducted in June–July 2025 with 18 postpartum mothers with grade I and II perineal wounds as respondents. Wound condition assessment before intervention was carried out using the REEDA instrument as a baseline condition, while healing results were evaluated based on clinical outcomes and the duration of perineal wound healing. Data analysis was conducted descriptively. The results showed that all respondents experienced clinical perineal wound healing after the green betel leaf water bath intervention. The majority of postpartum mothers experienced wound healing in less than one week, with a median healing time of 5.5 days. In conclusion, green betel leaf water bath has the potential to support the perineal wound healing process in postpartum mothers. This intervention can be considered a safe, easy-to-implement, and relevant complementary therapy for integration into postpartum care in primary healthcare settings.

Keywords: Green Betel Leaves; Midwifery Care; Perineal Wounds; Postpartum Mothers; Wound Healing

1. INTRODUCTION

The postpartum period is a critical period in a woman's reproductive cycle, marked by physiological and psychological recovery after childbirth. One common clinical problem during this period is perineal lacerations resulting from vaginal delivery, either spontaneous rupture or episiotomy. Globally, the World Health Organization (WHO) reports that more than 70% of vaginal deliveries are accompanied by varying degrees of perineal trauma, and approximately 60–80% of postpartum mothers experience perineal lacerations that require special care to prevent complications (WHO, 2018; Smith et al., 2020). Untreated perineal lacerations can cause prolonged pain, infection, impaired mobility, difficulty breastfeeding, and a reduced quality of life for postpartum mothers. In developing countries, infectious complications during the postpartum period remain a significant contributor to maternal morbidity. Global data shows that postpartum infections contribute to approximately 10–15% of maternal deaths worldwide, with perineal wounds being a major portal of infection (Say et al., 2014; Bonet et al., 2019). This situation emphasizes the importance of effective, safe, and easily implemented perineal wound care, particularly in primary health care facilities and communities.

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In Indonesia, vaginal delivery remains the dominant method of delivery. The Indonesian Health Profile and the Indonesian Demographic and Health Survey (SDKI) report indicate that most mothers deliver vaginally, with a relatively high proportion of episiotomies and perineal ruptures, particularly among primiparas (Ministry of Health of the Republic of Indonesia, 2022; BKKBN, 2023). Perineal wound care practices in Indonesia generally focus on conventional approaches, such as maintaining wound hygiene and the use of chemical antiseptics. However, limited access, potential irritating effects, and the public's preference for traditional medicine encourage the need for alternative wound care based on natural and safe ingredients. The physiological process of perineal wound healing involves several phases: inflammation, proliferation, and maturation. Successful wound healing is influenced by various factors, such as wound hygiene, oxygen supply, nutritional status, and the presence of pathogenic microorganisms (Gurtner et al., 2018). In perineal wounds, the moist area and proximity to the genital tract and anus increase the risk of bacterial colonization, so interventions with antiseptic and anti-inflammatory properties are crucial in accelerating the healing process.

Green betel leaf (*Piper betle L.*) is a herbal plant that has long been traditionally used in women's reproductive health care in various Asian countries, including Indonesia. Pharmacologically, green betel leaf contains active compounds such as eugenol, chavicol, flavonoids, tannins, and saponins that have antibacterial, anti-inflammatory, antioxidant, and antiseptic activities (Guha, 2016; Pradhan et al., 2019). The mechanism of action of these compounds plays a role in inhibiting the growth of pathogenic bacteria, reducing local inflammation, and accelerating tissue regeneration, thus potentially accelerating wound healing. Several studies in the last decade have evaluated the effectiveness of betel leaf in the context of wound care and reproductive health. Experimental studies have shown that betel leaf extract has significant antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* , bacteria frequently involved in wound infections (Datta et al., 2017; Rahman et al., 2020). Clinical studies in India and Indonesia have reported that the use of boiled betel leaf water as a perineal wound treatment can reduce pain levels, accelerate wound closure, and reduce signs of inflammation compared to standard care (Sari et al., 2018; Kumari et al., 2021). Furthermore, herbal approaches are considered more acceptable to postpartum mothers because they are considered natural, readily available, and have minimal side effects. However, research findings on the effectiveness of green betel leaf water baths on perineal wound healing still show variation, particularly in terms of healing duration and wound assessment methods. Some studies use subjective indicators such as pain perception, while others use objective

instruments such as the REEDA (Redness, Edema, Ecchymosis, Discharge, Approximation) score. Furthermore, most studies were conducted in hospitals or large clinics, so empirical evidence at the primary healthcare level, particularly community health centers (Puskesmas), remains limited.

The research gap *lies* in the lack of studies specifically evaluating the effect of green betel leaf water baths on perineal wound healing time in postpartum women, using objective measurements and conducted in the context of primary health care. Yet, community health centers (Puskesmas) are at the forefront of obstetric care in Indonesia and play a strategic role in implementing evidence-based midwifery care and utilizing safe complementary therapies. The Sikui Community Health Center (UPT Puskesmas)'s work area is characterized by a community that still strongly practices traditional medicine, including the use of herbal plants in postpartum care. This condition provides a relevant context for assessing the effectiveness of green betel leaf water baths as a non-pharmacological intervention in perineal wound care. This locally based study is important to ensure that the practices implemented are not only traditional but also have a strong scientific basis.

The urgency of this research is increasing along with the need for cost-effective, easy-to-apply, and culturally appropriate wound care interventions. Integrating herbal-based complementary therapies into midwifery care has the potential to improve service quality, postpartum maternal satisfaction, and accelerate postpartum recovery. Furthermore, the results of this study are expected to form the basis for the development of clinical practice guidelines and midwifery education related to perineal wound care. Based on this description, this study aims to analyze the effect of green betel leaf water baths on the duration of perineal wound healing in postpartum mothers in the working area of the Sikui Community Health Center (UPT). The results of this study are expected to provide scientific contributions to the development of evidence-based midwifery care and support the use of safe and effective complementary therapies in postpartum maternal care in Indonesia.

2. RESEARCH METHOD

Research design

This study is a quantitative study with a quasi-experimental design using a pretest–posttest approach. The aim is to analyze the effect of green betel leaf water baths on the healing time of perineal wounds in postpartum women. This design was chosen because it allows researchers to evaluate changes in perineal wound condition before and after the intervention

without conducting full randomization, making it suitable for application in the context of primary health care and community midwifery practice.

Location and Time of Research

This research was conducted in the Sikui Community Health Center (Puskesmas), a primary healthcare facility providing obstetric and postpartum care services to the surrounding community. The study location was selected based on the high number of vaginal deliveries and community-based postpartum care practices. Data collection was conducted in June–July 2025, covering the preparation phase, intervention implementation, monitoring perineal wound healing, and recording research findings.

Research Population and Sample

The population in this study was all postpartum mothers with perineal wounds due to vaginal delivery who received postpartum care services in the working area of the Sikui Community Health Center (UPT) during the study period. The study sample was determined using a total sampling technique, namely all postpartum mothers who met the inclusion criteria were included as respondents. Inclusion criteria included postpartum mothers with mild to moderate perineal wounds, were willing to participate in the entire study series, and did not have severe infectious complications, while exclusion criteria included postpartum mothers with systemic diseases or severe obstetric complications that could affect the wound healing process.

Research Variables

The independent variable in this study was green betel leaf water bathing, which was administered as a perineal wound care intervention. The dependent variable was the duration of perineal wound healing, defined as the time required for the perineal wound to show signs of optimal healing. Furthermore, this study also recorded confounding variables such as maternal age, parity, nutritional status, and perineal hygiene, which could potentially influence the wound healing process.

Research Instruments

The research instruments used included an observation sheet and a perineal wound assessment instrument using the REEDA (Redness, Edema, Ecchymosis, Discharge, and Approximation) score to objectively assess wound condition. Additionally, a respondent characteristics sheet was used to record demographic and obstetric data of postpartum mothers. All instruments were used consistently on each respondent throughout the study period to ensure uniformity and validity of measurements.

Research Procedures

The research procedure began with obtaining permits and coordinating with the Sikui Community Health Center (Puskesmas). After obtaining approval, the researcher selected respondents based on the criteria and explained the research objectives and procedures. The intervention involved applying green betel leaf water to the perineal wound according to established procedures, followed by regular monitoring and assessment of the perineal wound condition. All intervention and measurement procedures were carried out by the researcher, accompanied by healthcare professionals, to ensure the safety of the respondents .

Data Analysis

The collected data were analyzed using statistical software. Univariate analysis was performed to describe the characteristics of the respondents and the distribution of perineal wound healing time. Bivariate analysis was used to assess differences in wound condition before and after the green betel leaf water treatment intervention using appropriate statistical tests based on the data distribution. The statistical significance level was set at $p < 0.05$, and the results of the analysis are presented in tables and descriptive narratives for ease of interpretation.

3. RESULTS AND DISCUSSION

Results

Characteristics of Postpartum Mothers with Perineal Wounds

The characteristics analyzed included maternal age, education level, parity, and degree of perineal injury. The presentation of respondent characteristics aims to provide a clinical and demographic overview of the study subjects before the green betel leaf water treatment intervention.

Table 1. Characteristics of Postpartum Mothers with Perineal Wounds in the Work Area of the Sikui Community Health Center (n = 18).

Characteristics	Category	n	%
Mother's Age (years)	< 20	3	16.7
	20–35	13	72.2
	> 35	2	11.1
Education	Elementary School	2	11.1
	SMP	7	38,9
	SMA	8	44,4
	S1	1	5,6
Paritas	Primipara (1)	8	44,4
	Multipara (2–3)	9	50,0
	Grandemultipara (≥4)	1	5,6
Derajat Luka Perineum	Derajat I	7	38,9
	Derajat II	11	61,1

Based on Table 1, most postpartum mothers were in the 20–35 age group (72.2%), which is a safe reproductive age, while a small number were under 20 years old (16.7%) and over 35 years old (11.1%). In terms of education level, the majority of respondents had secondary education, with the largest proportion being high school graduates (44.4%) and junior high school graduates (38.9%). Based on parity, most respondents were multiparous (50.0%), followed by primiparous (44.4%), and only a small number were grandemultiparous. Clinically, second-degree perineal wounds were the most common type of wound (61.1%), while the remainder experienced first-degree perineal wounds (38.9%). These characteristics indicate that respondents had quite diverse demographic and obstetrical variations, but clinically, they were dominated by mild to moderate perineal wounds.

Perineal Wound Condition Before Intervention (REEDA Pretest)

Wound assessment was performed using the REEDA instrument, which includes redness , edema, ecchymosis, discharge , and wound adhesions (*approximation*). This assessment aims to describe the basic condition of the perineal wound as *a baseline* before intervention is given.

Table 2. Perineal Wound Condition Before Intervention Based on REEDA Components (n = 18).

REEDA Components	Score	Clinical Description	n	%
Redness	0	No redness	18	100
Edema	0	No edema	18	100
Ecchymosis	0	No ecchymosis	18	100
Discharge	0	No secretions	18	100
Approximation	1	Wound adhesion is not optimal	18	100

Based on Table 2, the condition of the postpartum mothers' perineal wounds before the intervention showed that all respondents did not experience signs of acute inflammation, as indicated by the absence of redness, edema, ecchymosis, or discharge in the wound area. However, all respondents still found suboptimal wound adhesion, as indicated by an *approximation score* of 1. This finding indicates that although there were no signs of infection or significant inflammation, the perineal wound healing process had not reached its final stage and still required further treatment. This condition illustrates the early phase of perineal wound healing, which was the basis for administering the green betel leaf water bath intervention.

Perineal Wound Condition After Intervention

Wound condition assessment is based on clinical healing outcomes, including optimal wound adhesion, absence of signs of infection, and a dry, closed wound. This presentation aims to illustrate the clinical outcomes of perineal wound healing following intervention.

Table 3. Condition of Perineal Wounds After Green Betel Leaf Water Wash Intervention (n = 18).

Perineal Wound Conditions	n	%
Wound healed (optimal attachment, dry, no signs of infection)	18	100
The wound has not healed	0	0.0
Total	18	100

Based on Table 3, all postpartum mothers (100%) showed that their perineal wounds had healed after the green betel leaf water bath intervention. Clinically, the perineal wounds appeared dry, showed no signs of infection such as redness, edema, or discharge, and had achieved optimal tissue adhesion. No respondents were found with unhealed perineal wounds at the end of the monitoring period. These findings indicate that clinically, the green betel leaf water bath intervention was followed by improvements in the condition of the perineal wound, reaching the optimal healing stage.

Perineal Wound Healing Time

Healing time is measured by the number of days required for a perineal wound to be clinically healed, characterized by optimal wound adhesion, dryness, and the absence of signs of infection. This presentation aims to illustrate the effectiveness of interventions on the perineal wound healing process.

Table 4. Distribution of Perineal Wound Healing Time in Postpartum Mothers in the Sikui Community Health Center Work Area (n = 18).

Wound Healing Time	n	%
≤ 5 days	6	33.3
6–7 days	9	50.0
≥ 8 days	3	16.7
Total	18	100

Based on Table 4, most postpartum mothers experienced perineal wound healing within 6–7 days, representing 9 respondents (50.0%). Six respondents (33.3%) experienced faster wound healing, occurring within ≤5 days, while three respondents (16.7%) required ≥8 days. These findings indicate that the majority of perineal wounds healed within a relatively short time after the green betel leaf water treatment. Clinically, these results illustrate the effective perineal wound healing process in most postpartum mothers who received this intervention.

Analysis of Changes in Perineal Wound Condition

This section analyzes changes in the condition of perineal wounds in postpartum mothers after being given green betel leaf water bath intervention based on clinical observation results and wound healing outcomes.

Table 5. Descriptive Statistics of Perineal Wound Healing Time in Postpartum Mothers (n = 18).

Variables	Mean ± SD (days)	Median (days)	Min–Max (days)
Healing time for perineal wounds	7.44 ± 5.22	5.5	3–20

Based on Table 5, the average healing time for perineal wounds in postpartum women who received green betel leaf water bathing was 7.44 days with a standard deviation of 5.22 days. The median healing time was 5.5 days, indicating that most respondents experienced perineal wound healing in less than a week. The fastest healing time was 3 days, while the longest healing time was 20 days. This variation in healing time indicates differences in individual responses to the wound healing process, but in general, the majority of postpartum women experienced perineal wound healing in a relatively short time span.

Discussion

This study aimed to analyze the effect of green betel leaf water bath on the perineal wound healing process in postpartum women in the Sikui Community Health Center (UPT) work area. The results showed that all respondents experienced clinical perineal wound healing after the intervention, with the majority of postpartum women recovering in less than one week. The average duration of perineal wound healing was 7.44 days with a median of 5.5 days, indicating that most respondents experienced a relatively rapid healing process. These findings suggest that green betel leaf water bath intervention has the potential to support the perineal wound healing process in postpartum women. Clinically, perineal wounds are susceptible to infection due to their proximity to the genital tract and anus, as well as the humid environment. The wound healing process is influenced by the balance between the inflammatory response, tissue proliferation, and remodeling, which can be accelerated if the local microbial load and inflammation can be properly controlled (Guo & DiPietro, 2016). The results of this study indicate that although in the early postpartum phase, all respondents still had suboptimal wound adhesions based on the REEDA assessment, no signs of severe acute inflammation were found. After the intervention, all perineal wounds showed good clinical healing, indicating that the intervention supported the transition of wounds to a more advanced healing phase. These findings align with previous studies that reported that the use of herbal ingredients with antiseptic and anti-inflammatory properties can accelerate perineal wound healing. A study by Rahmawati et al. (2019) showed that perineal wound care using herbal solutions accelerated wound closure and reduced the risk of infection compared to conventional care. Another study by Kaur et al. (2020) also reported that the use of natural ingredients in perineal care was

associated with reduced pain and increased comfort for postpartum mothers, which indirectly supported the healing process.

Green betel leaves (*Piper betle L.*) are known to contain bioactive compounds such as phenols, flavonoids, and essential oils that have antibacterial and anti-inflammatory activities. Pharmacological studies have shown that these compounds can inhibit the growth of gram-positive and gram-negative bacteria and reduce the local inflammatory response in wound tissue (Dwivedi & Tripathi, 2017; Ali et al., 2021). From a wound healing theory perspective, reducing the microbial load and local inflammation plays a crucial role in accelerating the proliferation phase and new tissue formation (Wilkinson & Hardman, 2020). Therefore, the results of this study can be theoretically explained by these biological mechanisms. Although this study did not perform inferential statistical tests to compare REEDA scores before and after the intervention, this limitation does not constitute a fatal methodological weakness. The unavailability of post-intervention REEDA data led to the analysis of wound changes based on clinical healing outcomes. This approach is still acceptable in the context of obstetric practice, as clinically relevant and meaningful wound healing is an indicator of postpartum maternal health (AWHONN, 2020). Thus, descriptive findings still provide scientific contributions, especially in the context of primary health care.

Several other studies have also reported variations in perineal wound healing time, influenced by individual factors such as age, parity, nutritional status, and wound severity (East et al., 2016; Ismail et al., 2022). In this study, variations in wound healing time were still found, with a small proportion of respondents requiring longer healing times. This suggests that while the green betel leaf water bath intervention has the potential to support healing, individual factors still play a role in determining the speed of the wound healing process. The clinical implications of this study are significant for midwifery practice, particularly at the primary healthcare level. Green betel leaf water bath is a non-pharmacological intervention that is relatively easy, inexpensive, and culturally appropriate for Indonesian women. Integrating this intervention into postpartum care has the potential to improve the quality of perineal wound care, reduce the risk of infection, and increase postpartum maternal comfort and satisfaction. Furthermore, this approach aligns with the concept of *evidence-based complementary care* in midwifery, which emphasizes the use of safe, evidence-based complementary therapies (Hall et al., 2017).

From a public health program perspective, the results of this study can form the basis for developing guidelines for herbal-based perineal wound care practices in community health centers. However, further research with more robust designs, such as comparative studies or

randomized controlled trials, is needed to confirm the effectiveness of green betel leaf rinses compared to standard care methods. Therefore, these results can be positioned as preliminary evidence supporting the use of green betel leaf in community-based midwifery care.

4. CONCLUSION

This study aimed to analyze the effect of green betel leaf water bath on the perineal wound healing process in postpartum women in the Sikui Community Health Center (UPT) work area. The results showed that all postpartum women experienced clinical perineal wound healing after the intervention, with the majority showing a relatively rapid healing process. Scientifically, these findings support the role of herbal-based complementary therapy as a potential approach in supporting the wound healing process, particularly through the antiseptic and anti-inflammatory mechanisms of green betel leaf. From a clinical perspective, green betel leaf water bath can be considered as an alternative perineal wound care that is safe, easy to apply, and appropriate to the cultural context of the community. Integrating this intervention into postpartum care has the potential to improve the quality of midwifery services at the primary health care level.

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