

RESEARCH ARTICLE

Effects of *Binahong* Leaf Decoction on Perineal Laceration Healing in Postpartum Women

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Abstract

A perineal laceration is a wound of the skin and muscular area between the vaginal and anal introitus caused by a labor tear. Perineal lacerations might occur in sudden and rapid removal of the fetus' head, excessive fetus size, and the inability of the pelvic muscles and soft tissues to accommodate the fetus's birth. One of the empirical non-pharmacology approaches to this study sought to understand the effect of *binahong* (*Anredera cordifolia* (Tenore) Steenis) leaf decoction on peritoneal wound healing in postpartum women. This is a quasi-experimental post-test-only control group study on 30 postpartum women treated in 15 private midwife practices in Bengkulu city from 10 November to 10 December 2022 who met the inclusion criteria. Subjects were sampled using the accidental sampling technique and were randomly divided into two groups. Wound healing was assessed using the REEDA scale, and the results were analyzed statistically using the Mann-Whitney or Wilcoxon test and the chi-square test. The study's results showed that Hb, age, and the number of children's influenced perineal wound healing. The average number of days for wound healing in the treatment group was six days. For a control group that used povidone-iodine 10% was eight days. It is concluded that there is an effect of decoction of the leaves of *binahong* (*Anredera cordifolia* (Tenore) Steenis) on the healing of peritoneal wounds in postpartum women.

Keywords: *Binahong*, perineal wound, postpartum

Introduction

Postpartum infection is the second leading cause of maternal death after bleeding if not treated immediately.¹ In Indonesia, the incidence of infection during the postpartum period reaches 2.7%, with 0.7% developing into an acute infection.² One of the infections frequently seen among postpartum women is birth canal laceration/injury, and a perineal laceration is experienced by 79% of women who underwent vaginal delivery.³ In spontaneous vaginal delivery, the most postpartum woman received perineal sutures caused by an episiotomy due to a spontaneous tear.⁴ Complications of perineal lacerations are delayed wound healing and infection, leading to pain and fear of moving that can cause uterine sub-involution, disrupted lochia discharge, and postpartum hemorrhage, which ranks first as the cause of maternal death in Indonesia.^{2,5}

Birth canal laceration care in postpartum women aims to reduce discomfort, maintain hygiene, prevent infection, and accelerate perineal wound healing. The quality of the perineal suture is considered good if there are no signs of

infection, such as redness, swelling, hot feeling, pain, and less function. Efforts to prevent perineal laceration infections include pharmacological therapy and non-pharmacological therapy. Povidone-iodine 10% is the substance that is often used for pharmacological treatment in preventing perineal laceration infection. This substance is a polyvinylpyrrolidone chemical with an iodine element that is useful for perineal wound care. However, it also has the potential for triggering allergic reactions and hampering collagen production, which is necessary for wound healing.⁶

A previous study has scientifically demonstrated that the leaves of *binahong* (*Anredera cordifolia* (Tenore) Steenis) are effective for wound healing due to their active contents of flavonoids, alkaloids, terpenoids, and saponin.⁷ The active flavonoid compound directly works as an antimicrobial agent by disturbing the activities of microorganisms such as bacteria and viruses and playing a role as an anti-inflammatory agent, analgesic, and antioxidant.⁸ Several studies stated that the *binahong* leaf is significantly more effective in perineal suture wound healing in a postpartum woman compared to povidone-

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iodine 10%.⁹⁻¹⁰ A study showed a significant effect of *binahong* leaf decoction water on perineal wound healing in a postpartum women.¹¹

The author assessed the postpartum perineal trauma in this study using the REEDA scale. This scale includes five items in the healing process: redness, edema, ecchymosis, discharge, and approximation (REEDA). In this scale, the timing and wound density is measured and observed one day after treatment.¹²

This study aimed to explore a non-pharmacological approach to understand the effect of *binahong* (*Anredera cordifolia* (Tenore) Steenis) leaf decoction on peritoeal wound healing in postpartum women. It is expected that a product, such as *binahong* extract or cream, can eventually be produced as non-pharmacological midwifery care to improve the quality of midwife care in the community.

Methods

This study was a quasi-experiment study using a posttest-only control group design. Two groups were established in this study. The first group was a treatment group, and the second was a control group. The treatment group consumed *binahong* decoction, while the control group used povidone-iodine 10%. Subjects' characteristics of Hb level, age, education, number of children, and antenatal care (ANC) visits were also collected to assess their relationship with perineal wound healing.

To assess the postpartum perineal trauma in this study, the REEDA scale was used. REEDA scale is a tool to assess perineal wound healing developed by Davidson and further refined by Carey.¹² This scale includes five items in the healing process: redness, edema, ecchymosis, discharge, and approximation (REEDA). In this scale, the timing and wound density is measured and observed one day after treatment.¹² Data were analyzed using the chi-square test and Mann-Whitney test. The results of the analysis were then tabulated as shown below. Interpretation of the level of Hb measurement: normal ≥ 11 g/dL, mild 8–10 g/dL, moderate < 8 g/dL. The duration of healing: rapid < 6 days; moderate 6–7 days; slow > 7 days.

The population in this study was 30 postpartum women who delivered their babies in 15 private midwife practices in Bengkulu city from 10 November to 10 December 2022 with sutured

or unsutured perineal lacerations and on their second-day postpartum. The sample consisted of all postpartum women with perineal tears who delivered their babies in a private midwife practice in Bengkulu city. They met the inclusion criteria: spontaneous postpartum mothers on day 2 to day 7 experienced a maximum degree of 3rd degree perineal laceration. Physically and mentally healthy, has no history of birth canal disease, and is willing to fill out informed consent.

The *binahong* leaves used in this study were mature leaves, which were apparent from their dark green color. The decoction used 320 grams of leaves already rinsed under running water and then boiled for 15 minutes in 2 glasses (400 mL) of boiling water using the infusion technique. The boiling was done in a covered clay pot to avoid damage to the active contents of *binahong* leaves until the remaining water was only half of the glass (100 mL).

The decoction was cooled at room temperature until around 35–40°C (lukewarm) and then strained to separate the water from the leaves. The decoction was then given to the postpartum women who experienced perineal laceration and perineal sutures from the 2nd day postpartum to the 7th day. The women consumed 100 mL of this *binahong* water only once a day in the morning.

This study has been approved by the Health Research Ethics Committee of Universitas Bengkulu under the ethical clearance number: 310/UN30.14.9/LT/2020. Declared to be ethically appropriate following 7 (seven) the 2016 Council for International Organizations of Medical Sciences Guidelines, 1) social values, 2) scientific values, 3) equitable assessment and benefits, 4) risks, 5) persuasion/exploitation, 6) confidentiality and privacy, and 7) informed consent.¹³

Results

Table 1 demonstrates that more than one-third of subjects (11 of 30) with normal Hb levels experienced rapid perineal wound healing, and Hb level influenced perineal wound healing in postpartum women ($p=0.002$). Most subjects in the age group of 20–36 years old seemed to experience rapid perineal wound healing (17 of 30), and age-affected perineal wound healing in postpartum women ($p=0.000$). Postpartum women who graduated from senior high school experienced normal perineal wound healing (8 of

Table 1 Effect of Social Demographic Characteristics on Perineal Wound Healing

Characteristics	Wound Healing			Total (n=30)	P*
	Rapid (n=12)	Normal (n=10)	Slow (n=8)		
Hb level (g/dL)					
Normal (≥11)	11	4	1	16	0.243
Mild (8–10)	1	6	5	12	
Moderate (≤8)	0	0	2	2	
Age (years)					
11–19	0	8	5	13	0.000
20–36	12	2	3	17	
Education					
Elementary school	1	0	0	1	0.759
Junior high school	2	1	1	4	
Senior high school	6	8	6	20	
Undergraduate	3	1	1	5	
Number of children					
1	12	2	1	15	0.001
2	0	6	4	10	
3	0	2	2	4	
4	0	0	0	0	
5	0	0	1	1	
Occupation					
Housewife	7	9	7	23	0.437
Employee	1	0	1	2	
Teacher	3	1	0	4	
Civil servant	1	0	0	1	

Note: *chi-square test, p<0.05 significant

30) compared with other groups, but educational background did not influence perineal wound healing in postpartum women (p=0.759). Women who had one child experienced rapid perineal wound healing, and the number of children affected the perineal wound healing in postpartum women (p=0.001). Nine out of 30 postpartum women who work as housewives experience normal perineal wound healing when compared to women with other occupations. The result of the analysis showed that occupation did

not affect perineal wound healing in postpartum women with p=0.437.

Table 2 presents the results of the Mann-Whitney test to see the difference and effect of *binahong* leaf decoction on perineal wound healing in postpartum women visiting private midwife practices in Bengkulu city. It was evident that there was a difference between the consumption of *binahong* leaf decoction and the use of povidone-iodine 10% in perineal wound healing. Thus, it can be stated that the provision

Table 2 Effect of *Binahong* Leaf Decoction on Perineal Wound Healing

Groups	Wound Healing			Total (n=30)	Mann-Whitney Test*	
	Rapid (n=12)	Normal (n=10)	Slow (n=8)		Statistics Test	p (Sig.)
Control	1	6	8	15	21,500	0.000
Treatment	11	4	0	15		

Note: *p<0.05 significant

of *binahong* decoction affected perineal wound healing in postpartum women with a p value of 0.000.

Discussion

Low hemoglobin levels mean a decrease in the capacity of the blood to carry oxygen, so tissue hypoxia often occurs. In addition, oxygen plays an essential role in collagen formation, epithelial repair, and infection control.¹⁴ The analysis results in this study showed that the highest percentage with normal Hb levels could accelerate perineal wound healing. Furthermore, there was an influence between Hb levels and perineal wound healing in postpartum women with a p value=0.002.

It is similar to the study by Tarsikah et al.,¹⁵ that the OR value of 51.3 means that the hemoglobin level in the normal category has a perineal wound healing time of 51.3 times faster than the hemoglobin level in the anemia category. Normally, hemoglobin levels have a time of healing perineum wound by 51.3 times shorter than hemoglobin levels of anemia categories.¹⁶

In this study, most subjects in the age group of 20–60 years old seemed to experience rapid perineal wound healing. Also, the subject's age affected the perineal wound healing in postpartum women with a p value=0.000, in which perineal wounds healed faster at a young age than older age. It is because the fusion of skin tissue of postpartum women who are not of productive age has decreased due to age factors.¹⁷ Another study supports a significant relationship between maternal age and the duration of perineal wound healing in postpartum women. The analysis obtained OR=4.9, indicating that mothers not at risk tend to have five times faster perineal wound healing time.¹⁸

This study showed that postpartum women who graduated from senior high school experienced normal perineal wound healing. The analysis results with a p value=0.759 indicated that educational background did not influence perineal wound healing in postpartum women. It is supported by other study results that there is no relationship between education and the duration of perineal wound healing, with a p value=0.221.¹⁹ The results of this study differ from the theory stated by Notoatmodjo²⁰ that the level of education has an exponential relationship with the level of health. It means the higher the

level of education, the easier it is to digest the information received.

The results of the analysis show a relationship between maternal and parent's knowledge of perineal wound healing with a p value=0.001, the high expertise possessed by the respondents will support them to be able to treat the perineal wound properly. The result showed a correlation between maternal and parent knowledge of perineal wound healing with a p value=0.001. The high knowledge possessed by the respondent will support them in treating the perineal wound properly so as not to cause infection. Other studies have a relationship between the knowledge of mothers and parents about healing perineal wounds. They must know how to do it and what is not. For example, how to maintain cleanliness, color in the wound area, and how to prevent infection.²¹

Based on the results of this study, it is known that women who had one child experienced rapid perineal wound healing. The chi-square test results with a p value of 0.001 were the number of children affected by perineal wound healing in postpartum women. The results of other studies support a significant relationship between maternal parity and the duration of perineal wound healing in postpartum women. The OR value was 6.25, indicating that mothers with children less than 2 tend to experience six times better perineal wound healing.¹⁸ Mothers with high parity (often get pregnant and give birth) can make mothers experience problems with nutritional needs and nutritional status, which usually affects wound healing.²²

Table 1 showed that most postpartum women who were housewives experienced normal perineal wound healing. That occupation did not affect perineal wound healing in postpartum women, with a p value of 0.437. Analysis of four ANC visits on perineal wound healing respondents from both groups was made so that they had a percentage of 100%. Antenatal care is an antenatal service provided to pregnant women. Services are given to prepare for labor and birth to prevent, overcome, and detect problems that may arise during pregnancy. The government makes policies for antenatal care programs with a frequency of visits at least four times during pregnancy and applies a minimum service standard in its implementation.²³

The study aimed to determine the efficacy of *binahong* leaves on forming granulation

tissue and re-epithelializing open wound healing macroscopically and microscopically. Macroscopically, the wounds treated with *binahong* leaves looked smaller and dry, while those not given *binahong* leaves looked deep and red. Microscopically, the wound was given *binahong* leaves, more granulation tissue was formed, and re-epithelialization was faster than those not treated with *binahong* leaves. Giving *binahong* leaves to wounds helps wound healing by developing more granulation tissue and quicker re-epithelialization than wounds not given *binahong* leaves.²⁴

A perineal suture wound healing is characterized by the absence of infections such as color (heat), rubor (redness), tumor (swelling), dolor (pain), and functional (impaired function). Suture wound healing usually occurs from the fifth to the seventh day. It can also be faster than five days, characterized by dry wounds, no redness, swelling, fused tissue, and no pain when sitting and walking. The wound healing process divides into five stages, including the stages of homeostasis, inflammation, migration, proliferation, and maturation.⁶

Binahong (*Anredera cordifolia*) was proven empirically by the locals in assisting speedy recovery from an injury. Clinical research with lab animals receiving blunt trauma injury based on macroscopically shown signs of 1) redness, 2) heat, 3) swelling and 4) lack of activity. There is also a microscopic indication of Infiltration of inflamed cells (migration of cells to the trauma area), cell necrosis, congestion (as a result of dead red blood cells), and edema.

On administration of *binahong* for three days, there is a significant drop of 5% in cell inflammation 2% increase in fibroblast (cell membrane) count. *Binahong* does assist in reducing cell inflammation and increasing counts of cells fibroblast.⁷

Table 1 shows that the treatment group had the most rapid wound healing; 11 of 30 subjects had differences in perineal wound healing between the two research groups. Besides, there was a significant effect of *binahong* leaf decoction on perineal wound healing in postpartum women who delivered their babies in a private midwife practice in Bengkulu city with a p value of 0.000.

Another study assessing *binahong* leaf extract as an alternative treatment for perineal wound healing in postpartum women found that the average number of days for wound healing in

the treatment group was six days. In contrast, the average days for a control group that used povidone-iodine 10% was eight days. *Binahong* leaf extract showed a faster healing process than povidone-iodine 10% (the control group). It is observed that there is a significant difference in the duration of wound healing between the treatment group and the control group.²⁵

Imron and Risneni²¹ showed that the longest healing time experienced by postpartum women who were given laceration treatment with povidone-iodine is ≥ 7 days, namely 38 respondents (95%) with an average healing time of 8 days. Meanwhile, 20 respondents (50%) who used *binahong* leaf decoction showed the average healing time is five days. The t test p value was 0.000 ($p < 0.05$), meaning there was a significant difference between perineal wound healing using povidone-iodine and *binahong* leaf decoction.¹⁰ In line with a study conducted by Narsih et al.,²⁶ the sample of this study was postpartum women with grade 2 perineal wounds for 1–7 days. The results showed a significant effect of giving *binahong* leaf decoction to a perineal wound.

The results of the intervention group showed that 52.71% healed after receiving treatment for perineal wounds using a decoction of *Anredera cordifolia* that sat and soaked. On the other hand, in the control group, only using clean water showed a 27.90% recovery. Analysis of effect data using *Anredera cordifolia* decoction 25% containing perineal wound healing showed the effect of sitting and soaked *Anredera cordifolia* decoction on perineal wound healing for postpartum mothers.²⁷

Results of the ANOVA test indicated that these differences were significant ($p = 0.000$). The ethanolic extract of *binahong* leaves was effective in wound healing. Post-hoc ANOVA showed that differences in wound healing expression were significant differences ($p = 0.000$) between *binahong* leaf extract 40% with povidone-iodine and *binahong* leaf 10%.²⁸

Kaur and Mondal²⁹ stated that the topical application of *binahong* leaf paste showed better-wound healing results than 0.9% NaCl and povidone-iodine on rat skin so that it can be used as an alternative to traditional home wound treatment. The results showed that the ethanol extract of *binahong* leaves contained total flavonoids of 11.263 mg/kg (fresh) and 7.81 mg/kg (dry). The flavonoids in the dry and fresh extracts belong to the flavonol group. The ethanol

extract of *binahong* leaves has total antioxidants of 4.25 mmol/100 g (fresh) and 3.68 mmol/100 g (dry). *Binahong* leaf ethanol extract also has the capacity of an antioxidant.³⁰ The results of the bivariate analysis test obtained the Asymp value. Sig. (2-tailed) 0.013 (<0.05), which means spray gel *binahong* (with basic CMC-Na) is effective in healing perineal wounds in postpartum mothers.³¹

Based on this study's results, *binahong* leaves are recommended as a non-pharmacological treatment for mothers. It is expected that a product, such as *binahong* extract or cream, can eventually be produced as non-pharmacological midwifery care to improve the quality of midwife care in the community. Further study is needed to explore *binahong* leaves' effects on mothers with severe perineal wounds.

Conclusions

There is an effect of decoction of the leaves of *binahong* (*Anredera cordifolia* (Tenore) Steenis) on the healing of peritoneal wounds in postpartum women.

Conflict of Interest

The authors declare there is no conflict of interest.

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