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Original Article

Accelerating perineal wound healing using binahong leaf extract sanitary pads

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A B S T R A C T

Background: Sanitary pads are essential for postpartum mothers to accommodate lochia and prevent infection in perineal wounds. Binahong leaves (*Anredera cordifolia*) contain flavonoids with antiseptic, antioxidant, and analgesic properties that promote wound healing by inhibiting microbial growth and reducing inflammation. However, research on the use of sanitary pads infused with Binahong leaf extract for perineal wound healing remains limited.

Objective: This study investigates the effectiveness of Binahong leaf extract sanitary pads in accelerating postpartum perineal wound healing.

Methods: A quasi-experimental study with a post-test-only randomized control group design was conducted at the Poasia Health Center, Kendari City. The study included postpartum mothers meeting specific inclusion and exclusion criteria, with a total sample of 34 participants (17 intervention, 17 control). The intervention group used Binahong leaf extract sanitary pads four times daily, while the control group relied on standard dry wound care. The intervention lasted seven days, and wound healing was assessed using the REEDA scale on days three, five, and seven.

Results: The findings demonstrated a significant effect of Binahong leaf extract sanitary pads on perineal wound healing. The intervention group (2.52 ± 0.87) experienced faster wound recovery than the control group (5.23 ± 1.67) ($p < 0.001$).

Conclusion: Binahong leaf extract sanitary pads effectively accelerate perineal wound healing in postpartum mothers and may serve as an alternative wound care approach.

INTRODUCTION

Perineal injury is a common occurrence during childbirth, affecting the perineum, labia, vagina, and cervix. While most cases heal without complications, severe injuries can lead to prolonged pain, sexual dysfunction, incontinence, and infection, which may contribute to maternal morbidity and, in extreme cases, mortality.[1,2] To minimize these risks, effective wound management is crucial in accelerating the healing process. Conventional treatments include antibiotics and analgesics, while non-pharmacological approaches, such as herbal remedies, are gaining attention for their potential benefits.

Binahong (*Anredera cordifolia*) is a medicinal plant traditionally used in wound healing. Its extract contains bioactive compounds such as alkaloids, glycosides, flavonoids, steroids, and tannins, which exhibit antibacterial, anti-inflammatory, and antioxidant properties.[5,6] These compounds promote wound recovery by stimulating fibroblast proliferation and collagen synthesis. Given the high incidence of perineal wounds following vaginal delivery, postpartum sanitary pads play a vital role in wound care by maintaining hygiene and preventing infection.[8,9]

Recent innovations in postpartum care have introduced modified sanitary pads, such as those infused with antibacterial agents like copper, which have been shown to improve comfort, reduce anxiety, and lower infection risk in perineal wounds.[10,11] Incorporating Binahong leaf extract into sanitary pads presents a novel and practical alternative to traditional applications, such as boiled simplicia water or topical extracts. Unlike ointments, which may be inconvenient due to their sticky texture, or spray gels, better suited for larger areas, sanitary pads infused with herbal

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extracts provide continuous contact with the perineal wound, potentially enhancing healing outcomes.[12]

Despite the promising properties of Binahong leaf extract, no prior research has explored its application in sanitary pads for perineal wound healing. Therefore, this study aims to evaluate the effectiveness of Binahong leaf extract sanitary pads in accelerating postpartum perineal wound recovery.

METHOD

Study Design

This study employed a quasi-experimental design with a post-test-only randomized control group approach.

Settings and Respondents

The study, conducted from January to March 2023 at Poasia Health Center, Kendari City, involved 34 postpartum mothers (17 intervention, 17 control) selected through simple random sampling. Inclusion criteria were vaginal delivery with grade II perineal wounds and no diabetes history, while exclusion criteria included cesarean wounds, postpartum complications, diabetes, or unwillingness to participate. Participants were chosen through simple random sampling.

Variables, Instruments and Measurements

The intervention used Binahong leaf extract sanitary pads (1.32 cc extract, dioxin- and chlorine-free). Compliance was assessed based on usage four times daily for seven days. Wound healing was measured using the REEDA scale on days 3, 5, and 7, categorized as good (0–2), moderate (3–5), or poor (6–15). Age and parity were recorded via questionnaire.

Experimental Procedure

The intervention group used binahong extract pads, changed every four hours for seven days, while the control group received conventional dry clean treatment using clean water and air drying.

Statistical Analysis

Descriptive statistics summarized clinical data as means and standard deviations. Levene's test assessed variance homogeneity, Kruskal-Wallis tested wound healing across time points, and Mann-Whitney U evaluated intervention effectiveness ($p<0.05$ significance level).[13]

Ethical Considerations

The research protocol, with number 065/EA/KEPK/2023, has been approved by the Health Research Ethics Committee of the Health Polytechnic of the Ministry of Health, Semarang.

RESULT

Figure 1 shows a sanitary pad infused with 1.32 cc of binahong extract containing 1.39 mg of flavonoids.

Table 1 indicates no significant differences in age ($p=0.10$) and education ($p=0.37$), but parity ($p<0.001$) and job characteristics ($p<0.001$) differ significantly. Figure 2 shows that wound healing in the intervention group accelerated significantly, with a score of 2.52 on day 3 and zero from days 5 to 7, while healing in the control group took longer.

Figure 1. Sanitary Napkin Product with Binahong Leaf Extract

Table 1. Characteristics of Postpartum Mothers Between The Intervention Group and Control Group

Characteristic	Result	
	Intervention	Control
Age		
Mean	27,23±5,71	26,05±5,10
Min-max	16-40	17-37
Parity		
Primipara	8 (47,1%)	3 (17,6%)
Multipara	9 (52,9%)	14 (82,4%)
Education		
Junior High School	4 (23,5%)	1 (5,9%)
Senior High School	10 (58,8%)	13 (76,5%)
College	3 (17,6%)	3 (17,6%)
Occupation		
Working	7 (41,2)	3 (17,6%)
Not working	10 (58,8%)	14 (82,4%)

The effectiveness of binahong extract sanitary pads on perineal wound healing showed a significant difference between groups ($p<0.001$). Table 2 shows the highest score reduction on day 5, with the intervention group reaching zero (fully healed), while the control group remained at 1.58 on day 7, indicating slower healing.

Table 2. Effectiveness of Binahong Extract Pads on Perineal Wound Healing in Intervention vs. Control Groups

Variable	Group		Mean ± SD	p-value
Perineal wound healing time	The 3rd day	Intervention	2,52 ±0,87	0.001
		Control	5,23±1,67	
	The 5th day	Intervention	0,00±0,00	0.001
		Control	3,47±1,50	
	The 7th day	Intervention	0,00±0,00	0.001
		Control	1,58±1,27	

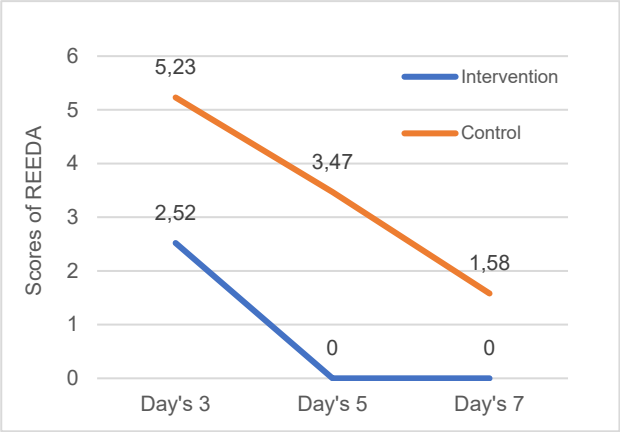

Figure 2. Average wound healing of postpartum between the intervention group and control group

DISCUSSION

This study demonstrated that using Binahong leaf extract sanitary pads four times daily for seven days significantly accelerated perineal wound healing compared to the control group. Given that 85% of women experience perineal tears after vaginal delivery, antibiotics are commonly prescribed post-suturing to prevent infection and ensure proper healing.[14] Binahong extract pads offer an alternative due to their flavonoid content (1.39 mg per pad), an anti-inflammatory and antibacterial agent. Flavonoids disrupt microbial growth, triggering an inflammatory response that attracts white blood cells and promotes tissue repair.[15] Macrophages further aid in phagocytosis and release growth factors that activate keratinocytes for re-epithelialization.[16]

Saponins in Binahong leaves cleanse wounds and stimulate collagen production, enhancing healing.[17] Other bioactive compounds, including alkaloids, polyphenols, ascorbic acid, and oleanolic acid, exhibit antibacterial properties that prevent infection.[18] Traditionally used in Indonesia, particularly by the Tengger tribe, *Anredera cordifolia* (Binahong) has well-documented wound-healing benefits.[19] Drug-likeness studies confirm that its compounds—linoleic acid, phytol, and hexadecanoic acid—possess strong antibacterial potential. A 3% Binahong extract gel has been shown to improve palatal mucosa recovery, while its combination with silver nanoparticles and cinnamon essential oil exhibits potent antibacterial activity against Staphylococcus aureus.[20,21] Additionally, Binahong extract combined with cyclooxygenase-2 inhibitors promotes wound healing without scarring, highlighting its therapeutic potential.[22,23]

The synergy of saponins, flavonoids, and tannins accelerates fibroblast proliferation and collagen formation, which is essential for perineal wound healing. In diabetic wounds, Binahong's antioxidant gel, when incorporated into brown algae-based wound dressings, further enhances the healing process.[25] In diabetic wounds, its antioxidant gel, combined with brown algae in wound dressings, enhances the healing process.[26] These findings suggest that Binahong leaf extract sanitary pads can be an effective, natural alternative for postpartum perineal wound care, reducing dependence on conventional treatments while maintaining hygiene and promoting faster recovery.

CONCLUSIONS AND RECOMMENDATION

Sanitary pads with binahong leaf extract (Anredera cordifolia) effectively treat perineal wounds in postpartum mothers and can be recommended as an alternative. This study is the first to explore their healing effects, requiring further research with larger samples. Given binahong's proven benefits in wound healing, its application for perineal wounds should be further developed. Future studies can consider additional variables such as physical activity, nutrition, knowledge, and cultural practices.

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