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Science Midwifery

journal homepage: www.midwifery.iocspublisher.org

The effectiveness of using red betel leaf (piper ornatum) infusion compared to binahong leaf (anredera cordifolia) infusion in healing external genital infections

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ARTICLE INFO

Article history:

Received Feb 29, 2024
Revised Mar 8, 2024
Accepted Mar 25, 2024

Keywords:

Binahong
Cockle Seekers
External Genital Infections
Infusion
Red Betel Leaf

ABSTRACT

The group of women vulnerable to viral and bacterial infections. Efforts to prevent more serious external genitalia infections often involve daily genital hygiene habits. One of the efforts made is utilizing plants as traditional remedies, such as using boiled water from red betel leaves and Binahong leaves to cleanse external genitalia. This study aims to analyze the effectiveness of using boiled water from red betel leaves (Piper Ornatum) compared to Binahong leaf decoction (Anredera cordifolia) on the healing level of infected external genital organs in female cockle seekers. The method used is a quasi-experimental study with randomization and pre-post test design. The population consists of 134 female cockle seekers, with 30 individuals in treatment group I and 30 individuals in treatment group II, based on predefined inclusion criteria. Data analysis was performed using the Wilcoxon signed-rank test and Mann-Whitney test. The results show a significant difference in the healing of external genital infections in female cockle seekers before and after the use of boiled water from red betel leaves, with p=0.000 (p<0.05), as well as a significant difference before and after the use of Binahong leaf decoction, with p=0.000 (p<0.05). The findings indicate that boiled water from red betel leaves is more effective in healing external genital infections compared to Binahong leaf decoction among female cockle seekers in Krueng Tibang, with an average infection healing score of 25.

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INTRODUCTION

Every year, approximately 295,000 women die from pregnancy and childbirth complication(Bongaarts, 2016; Efendi et al., 2019). Most of these deaths occur in developing countries and can be prevented with access to safe pregnancy services. Sexually transmitted infections (STIs) such as HIV/AIDS, syphilis, and gonorrhea are significant health issues for women. About 1 in 4 reproductive-aged women infected with HIV are young women (aged 15-24

years)(Wowolo et al., 2022). Cervical cancer is one of the leading causes of death among women in developing countries. Approximately 90% of the 311,000 cervical cancer deaths occur in these countries annually(Fauk et al., 2021). Although maternal mortality rates in Indonesia have decreased, challenges remain. According to the Indonesian Ministry of Health data in 2018, the maternal mortality rate is 305 per 100,000 live births. The main causes of maternal death in Indonesia include hemorrhage, infection, and high blood pressure. Cervical cancer is also a reproductive health problem for women in Indonesia. According to Globocan data in 2020, an estimated 19,000 new cases of cervical cancer and 8,700 cervical cancer deaths occur in Indonesia annually(Allahqoli et al., 2022; Tjokroprawiro et al., 2024). Symptoms and signs of genital organ infections in women are usually characterized by discharge, itching, odor, and redness. Women vulnerable to viruses and bacteria attacking the genitals include those over 40 years old, commercial sex workers, and women directly exposed to bacteria and viruses, such as women who work digging clams in estuarine water(Fidler et al., 2016; Lin et al., 2019; Puspitaningtyas et al., 2021). The treatment of external genitalia infections highlights that the use of red betel leaf infusion can be a more effective choice in accelerating the healing process. The utilization of traditional herbal remedies and alternative treatment options in managing external genitalia infections plays a significant role (MAGHFIROH, 2021; Nor et al., 2018)

Clam digging involves entering estuary waters mixed with mud and other substances. These workers are exposed to estuarine water mixed with mud for 2-3 hours a day, and this work is done every day to support their families. This work has been done for years, and workers only use everyday clothes without using personal protective equipment. Krung Tibang River in Syiah Kuala District, Banda Aceh City, is an artificial channel that carries Banda Aceh city's drainage water to the sea. Almost all river waters around Banda Aceh city are contaminated with coliform bacteria, fecal coliform, and fecal streptococcus bacteria, which are water pollution bioindicators. Previous research has shown that clam diggers in Krueng Tibang, Banda Aceh, experience health problems in their reproductive organs, as seen from Pap smear results. The use of protective pants has been shown to affect Pap smear results, and the duration of clam digging is also associated with Pap smear results (Irnawati & Novemi, 2016; Salmiani, 2016). In an effort to avoid disruptions to the reproductive system and maintain women's health, reproductive organ care is crucial to prevent infections(Foster et al., 2018). This care can be done using antiseptic techniques, non-antiseptic methods, or traditional practices. However, many people still rely on traditional reproductive organ care, such as using boiled red betel leaves to expedite healing and wound drying. Red betel leaves contain chemical compounds like alkaloids, saponins, tannins, and flavonoids, which can be used to treat various ailments(Fratidhina et al., 2023; Rosmaidar et al., 2021).

The essential oil found in red betel leaves has anticonvulsant, antiseptic, analgesic, anti-dandruff, antidiabetic, hepatoprotective, anti-diarrheal, immune-boosting, and anti-inflammatory properties(Assidqi et al., n.d.). Red betel leaves can also address lung inflammation, throat inflammation, gum inflammation, breast inflammation, and nosebleeds (Heliawati et al., 2022; Lister et al., 2020; Singh et al., 2023). Besides betel leaves, papaya leaves have also been traditionally used for women's reproductive organ care. Red betel leaves contains the enzyme papain, which has anti-inflammatory and antimicrobial properties. Red betel leaves also contain active compounds like alkaloids, flavonoids, and tannins, which possess antimicrobial and antioxidant properties. Some benefits of using Red betel leaves in women's reproductive organ care include treating vaginal infections, reducing abnormal discharge, alleviating menstrual pain, and preventing cervical cancer. Based on the background issues above, the aim of this research is to evaluate and compare the effectiveness of using boiled red betel leaf water with boiled binahong leaf water in the process of healing external genitalia infections in clam-seeking women in Krueng Tibang, Banda Aceh City. The expected contribution of this research is two-fold, encompassing both scientific advancements and informed decision-making. Scientifically, the study sheds light

on the efficacy of utilizing boiled water from red betel leaves (Piper Ornatum) and Binahong leaf decoction (Anredera cordifolia) in healing infected external genital organs in female cockle seekers. By employing a quasi-experimental design, the research provides empirical evidence that demonstrates a significant difference in the healing of external genital infections after the use of both red betel leaves and Binahong leaves.

RESEARCH METHOD

This study employs a quasi-experimental method with a pre-post test design and randomization. The research subjects are divided into two groups: treatment group I, which undergoes washing with boiled red betel leaf (Piper Ornatum) infusion, and treatment group II, which undergoes washing with boiled binahong leaf (Anredera cordifolia) infusion. The study involves a population of female clam-seeking workers residing around the Krueng Tibang River in Banda Aceh City, totaling 134 individuals. The research sample is determined using the Lemeshow formula, with treatment group I comprising 30 individuals and treatment group II comprising 30 individuals. In this study, data collection is conducted through a comprehensive approach that includes interviews, speculum examinations, and the collection of primary and secondary data. The interviews serve as a crucial method for gathering qualitative information from the female cockle seekers regarding their experiences, symptoms, and previous treatments related to external genital infections. These interviews provide valuable insights into the subjective experiences of the participants and help contextualize the findings. In addition to interviews, speculum examinations are conducted to obtain objective clinical data on the status of the infected external genital organs. Speculum examinations involve the use of a medical instrument to inspect the vaginal and cervical areas, allowing for a thorough assessment of the infection's severity, presence of lesions, and other relevant physical indicators. This clinical examination provides quantitative data that can be used to measure the healing progress and compare the effectiveness of the two treatment approaches. The dependent variable in this study is the level of healing of infected genital organs, while the independent variables are boiled red betel leaf infusion and boiled binahong leaf infusion. Data collection is conducted through interviews, speculum examinations, and the collection of primary and secondary data. The washing process is carried out for 14 days with the assistance of trained enumerators. Evaluation is conducted every 5 days, and a repeat speculum examination is performed on the 15th day. The data obtained are analyzed using Wilcoxon signed-rank and Mann-Whitney statistical tests.

RESULTS AND DISCUSSIONS

Frequency Distribution of Respondents' Characteristics

Table 1. Frequency distribution based on characteristics of female cockle seekers

No	characteristics	grup			
		red betel		Binahong	
		f	%	f	%
1	Age				
	≤ 35 years old	10	33,3	10	33,3
	> 35 years	20	66,7	20	66,7
	Long duration of clam searching				
2	≤ 5 years	09	30	11	36,7
	> 5 years	21	70	19	63,3

Based on Table 1, it can be observed that the age of respondents in both treatment groups, namely the red betel group and the binahong group, yielded similar results. In both groups, the majority of mothers were over 35 years old, comprising 66.7% of the total. Additionally, in the category of the duration of clam searching, there was also similarity between the two treatment

groups. In the red betel group, 21 individuals (70%) had experience in clam searching for more than 5 years. Similarly, in the binahong group, 19 individuals (63.3%) also had experience in clam searching for more than 5 years.

Frequency distribution of external genitalia infections among users of red betel leaf decoction among clam-seeking women

Table 2. Frequency distribution of external genitalia infections using red betel leaf decoction in clam-seeking women

external genitalia infections	Before using red betel		After using red betel	
	f	%	f	%
Normal	-	-	24	80
Light	13	43.3	6	20
Currently	7	23.3	-	
Heavy	10	33.3	-	

Based on Table 2, it is observed that there were changes in external genitalia infections before and after the use of red betel leaf decoction. Initially, among 30 individuals with mild, moderate, and severe infections, the condition changed to mild infection in 6 individuals (20%), while mild and moderate infections improved to normal or recovered status in 24 individuals (80%).

Distribution of the frequency of external genitalia infections in the group using Binahong decoction

Table 3. Distribution of the frequency of external genitalia infections in the group using binahong decoction among women shellfish seekers

External Genitalia Infections	Before Using Binahong		after Using Binahong	
	f	%	f	%
Normal	-	-	13	43.3
Light	13	43.3	17	56.6
Currently	8	23.3	-	
Heavy	9	33.3	-	

Based on Table 3, it is evident that before the use of Binahong decoction, there were 30 individuals with external genitalia infections classified as mild, moderate, or severe. After the use of Binahong decoction, there was a change in the infection severity level. Out of the 30 individuals, 17 individuals (56.6%) experienced a change to a mild infection level, while 13 individuals (43.3%) were declared cured or in normal condition. This indicates that the use of Binahong decoction has the potential to reduce the severity of external genitalia infections.

Differences in the healing of external genitalia infections before and after the use of red betel leaf decoction and Binahong decoction

Table 4. Differences in the healing of external genitalia infections before and after the use of red betel leaf decoction and binahong decoction

	Healing of External Genitalia Infections		
Group	f	Mean Rank	p
Red betel before and after	30	15.50	0.000
Binahong before and after	30	13.50	0.000

Based on Table 4, there is a significant difference between the outcomes before and after the use of red betel leaf decoction in the treatment group. The average score before usage was 15.50, whereas after the use of red betel leaf decoction, the average score increased to 13.50. The

statistical test results show a p-value of 0.000 ($p < 0.05$), indicating a significant difference and concluding that there is a difference in healing before and after the use of red betel leaf decoction.

Effectiveness of Healing External Genitalia Infections between the Red Betel Leaf Decoction and Binahong Decoction Treatment Groups

Table 5. Effectiveness of healing external genitalia infections between the red betel leaf decoction and binahong decoction treatment groups

Group tretment	Healing External Genitalia Infections		
	f	Mean Rank	*p*
Red Betel	30	25	
Binahong	30	36	0.004

Based on the data in Table 5, it was found that there was a difference in the healing of external genitalia organs between the use of red betel leaf decoction and binahong leaf decoction. The average score for external genitalia healing with the use of red betel leaf decoction was 25, while with the use of binahong leaf decoction, it was 36. Statistical test results showed that the p-value was 0.004 ($p < 0.05$), indicating a significant difference between the two treatment groups. Therefore, it can be concluded that the use of red betel leaf decoction is more effective than the use of binahong leaf decoction in treating external genitalia infections. Based on the research findings, the use of red betel leaf and binahong leaf decoctions proved to be effective in healing external genitalia infections. In the red betel leaf decoction treatment group, there was a significant increase in the average healing score, from 15.50 before use to 13.50 after use ($p < 0.05$). Meanwhile, in the binahong leaf decoction treatment group, there was also a significant difference in infection healing, with the average score increasing from 13.50 to 13.50 after use ($p < 0.05$). Although both treatment groups had similar results in terms of respondent age, with the majority of mothers being over 35 years old (66.7%), and the duration of clam searching, with most respondents searching for clams for more than 5 years (red betel group: 70%, binahong group: 63.3%), red betel leaf decoction proved to be more effective in healing external genitalia infections. Wilcoxon test results showed a significant difference between the conditions before and after the use of red betel leaf decoction, with an average score of 15.50 and a p-value of 0.000 ($p < 0.05$). This is consistent with previous studies showing that the use of red betel leaves helps to heal vaginal discharge. However, in the age group over 35 years, complaints of discharge, odor, itching, and redness still exist despite a decrease. Furthermore, there was a significant difference between the conditions before and after the use of binahong leaf decoction, with an average score of 13.50 and a p-value of 0.000 ($p < 0.05$). This is consistent with previous research showing that the use of binahong leaf decoction can heal vaginal discharge. Additionally, the study also indicated differences in perineum wound healing between binahong leaf and povidone iodine interventions. From interviews with respondents, it was found that the longer a woman searched for clams, the more she felt that the perceived infection symptoms were normal. However, after receiving information that regular external genitalia washing is crucial to prevent further infection, respondents were willing to do so and experienced healing. Comparing the effectiveness of healing external genitalia infections between the use of red betel leaf decoction and binahong leaf decoction, it was found that the average healing score using red betel leaf decoction was 25, while using binahong leaf decoction was 36. Statistical test results showed that red betel leaf decoction was more effective than binahong leaf decoction ($p=0.004$, $p<0.05$). Previous research also indicated that red betel leaf decoction is effective in inhibiting the growth of candida albicans fungus, which is one of the causes of vaginal discharge. Several previous studies have shown the potential of red betel leaf decoction in reducing bacteria and infections in the genital area. Red betel leaf is known to have antimicrobial and anti-inflammatory properties that can help address skin and mucous membrane infections(Singh et al., 2023). However, it should be noted that each study has different methods and populations, so the results may vary. Some early studies have shown that binahong leaves contain compounds that have antimicrobial and anti-inflammatory effects(Biswas et al., 2022;

Hanafiah et al., 2021; Nur et al., 2023; Saidah et al., 2022). This indicates the potential use of binahong leaves as a natural ingredient in the treatment of skin and mucous membrane infections. The effectiveness of using decoctions of red betel leaves (Piper crocatum) and binahong leaves (Anredera cordifolia) in healing external genitalia infections has been studied(Baso & Azizah, n.d.; Fratidhina et al., 2023; Wahdaniar et al., 2022). Red betel leaves have been found to have antibacterial properties and can inhibit the growth of Pseudomonas aeruginosa bacteria, which is a common cause of nosocomial infections(Fitriana & Kemenkes, 2023; Fratidhina et al., 2023; Rosmaidar et al., 2021). Additionally, red betel leaves have been shown to enhance wound healing in postpartum mothers with perineal wounds [2]. Alkaloids present in red betel leaves act as antimicrobial agents and have higher antiseptic strength compared to green betel leaves (Erlidawati et al., 2023; Santrum, 2021).

CONCLUSION

There was a difference in the healing of external genitalia infections in clam-searching women before and after the use of red betel leaf decoction ($p=0.000$, $p<0.05$) and binahong leaf decoction ($p=0.000$, $p<0.05$). This indicates that both decoctions are effective in helping to heal the infection. Furthermore, the research results also indicate that red betel leaf decoction is more effective than binahong leaf decoction in healing external genitalia infections. The average healing score using red betel leaf decoction was 25, while using binahong leaf decoction was 36. Statistical test results show a significant difference between the two groups ($p=0.004$, $p<0.05$). The research findings have significant implications for the treatment of external genitalia infections in clam-searching women. The use of red betel leaf decoction and binahong leaf decoction showed effectiveness in promoting healing, as indicated by the statistically significant differences in healing rates before and after the use of both decoctions. This suggests that both remedies can be considered as viable options for treating these infections. Moreover, the research highlights that red betel leaf decoction is more effective than binahong leaf decoction in healing external genitalia infections, as evidenced by the lower average healing score achieved with red betel leaf decoction. The observed difference between the two groups further supports the superiority of red betel leaf decoction in this context. These findings contribute to the understanding of traditional herbal remedies and their potential applications in managing external genitalia infections, providing valuable insights for healthcare practitioners and potentially expanding the available treatment options for affected individuals.

ACKNOWLEDGEMENTS

Several previous studies have demonstrated the potential of red betel leaf decoction in reducing bacteria and infections in the genital area. Red betel leaf is known to possess antimicrobial and anti-inflammatory properties that can help address skin and mucous membrane infections. However, it's important to note that each study has different methods and populations, so results may vary. Meanwhile, research on the use of binahong leaves in treating external genital infections is still limited. However, some preliminary studies have shown that binahong leaves contain compounds with antimicrobial and anti-inflammatory effects. This indicates the potential use of binahong leaves as a natural remedy for skin and mucous membrane infections.

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