



## THE EFFECTIVENESS OF RED BETEL LEAF AND ALOE VERA IN THE TREATMENT OF PERINEAL WOUNDS: LITERATURE REVIEW

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ABSTRACT	Keywords
<p>Treatment of perineal wounds in postpartum women can be done by pharmacological and non-pharmacological methods, namely through complementary therapy with the use of herbs, which is betel leaf and aloe vera that have anti-inflammatory, anti-septic, anti-fungal and antibacterial effects. The purpose of this study was to determine the effectiveness of red betel leaf and aloe vera in the treatment of perineal wounds. This study uses a Literature Review, journal searches using Medline, PubMed, Tandfonline and Google Scholar databases for the last ten years. Analysis of the data used is descriptive statistics. Some literature discusses the treatment of perineal wounds using red betel leaf and aloe vera and has been shown to be effective in the perineum wound healing process in post artum mothers with an average length of healing that is faster than treatment without the intervention of red betel leaf and aloe vera. Conclusion, red betel leaf and aloe vera can be applied in the treatment of perineal wounds in postpartum.</p>	<p><i>Red Betel Leaf, Aloe Vera, Perineal Wound, Literature Review</i></p>

### INTRODUCTION

Indonesia's maternal mortality rate until 2019 is still high, at 305 per 100,000 live births<sup>1</sup>. One of the contributors to the maternal mortality rate is infection during the puerperium, which ranks second after bleeding that occurs in the genitals after delivery, which is caused by unsterile equipment, perineal rupture, bleeding, and poor hygiene in the perineal area<sup>2,3,4</sup>.

The wound healing process is a physiological process that involves components in the form of cells and chemical substances needed in the process of inflammation, angiogenesis, and collagen deposition. Improper care of perineal

wounds can result in moist lochia conditions and support the proliferation of bacteria that cause infection in the perineum which will spread to the urinary tract and birth canal. The entry of bacteria that are commensal and become infectious will increase the risk of postpartum infection<sup>5,6,7</sup>.

Perineal wound care is also influenced by external factors (environment, tradition, knowledge, socio-economics, handling staff, maternal condition, and nutrition) and internal factors (hemorrhage, hypovolemia, local edema factors, nutritional deficits, personal hygiene, oxygen deficit, medication and overactivity). The application of treatment can be done pharmacologically and non-

pharmacologically, namely the use of herbal plants that can come from the leaves, fruit, seeds, tubers, stems, roots, and rhizomes. Some plants commonly used as complementary therapies are herbal medicine, Ayurveda, Siddha, Unani, Aloe Vera, and betel<sup>8,9,10,11</sup>.

Red betel leaf (*piper crocatum*) has twice the antiseptic power as green betel leaf. The chemical constituents of red betel extract include essential oils, hydroxycavikol, cavikol, cavibetol, allilprocatekol, carvacrol, eugenol, p-cymene, cineole, cariofelen, cadmium estragol, terpenes and phenyl propada. Carvakrol is a disinfectant and antifungal so it is used as an antiseptic drug and contains flavonoids, alkaloids, and tannins as antimicrobials and has an antibacterial effect against *Staphylococcus aureus* and *Eschericia coli*<sup>12,13</sup>. Research conducted by Rosita, et al (2020) with independent t-test results with p-value = 0.001 showed that the use of red betel leaf boiled water affected the healing time of perineal wounds<sup>14</sup>.

Perineal wound care in postpartum mothers can be done by boiling 20 pieces of red betel leaf for 10 minutes at 36°C and used 4 times a day as much as 500cc for vulvar hygiene<sup>15,16</sup>. In addition, a study conducted by Siregar, et al (2018) with the results of the non-paired sample test p = 0.002 showed that there was a significant difference in the average length of time for perineal wound healing between those given piper crocatum and those not given<sup>2</sup>.

Another plant that can be used in the treatment of perineal wounds is aloe vera, which contains saponins, flavonoids, and polyphenols as cleansers so that it is effective for healing open wounds, while tannins are used as infection prevention and are useful as antiseptics. The main components of aloe vera liquid are aloin, emodin, resin, gum, and other elements such as essential oils. When the stem is split, there is a clear jelly-like liquid that contains antibacterial and anti-fungal substances and stimulates fibroblasts to heal wounds<sup>10</sup>. Research conducted by Dewi, et al (2020), using the Mann Withney test with p-value = 0.001 showed that aloe vera gel compresses

can reduce pain and accelerate perineal wound healing.<sup>17</sup>.

As described above, herbal plants such as red betel leaf and aloe vera can be applied as complementary therapies in the healing process and wound care, including in the treatment of perineal wounds which have been proven in several studies regarding their effectiveness, which is known to contain infection prevention and antiseptic properties. The preparation of this literature review focuses on discussing the treatment of perineal wounds with the application of complementary therapies using red betel leaf and aloe vera with related journal searches and drawing conclusions. Previously, there were no related studies that combined the use of red betel leaf and aloe vera, therefore, researchers were interested in compiling this literature review.

## METHOD

This study uses a literature review design. The literature used in this study is in the form of journals that were searched using the MEDLINE, PubMed, Tandfonline and Google Scholar databases in 2011-2021. The search used the keywords for perineal wound care (wound healing perineal), "or" red betel (*piper crocatum*), "or" aloe vera. The search was carried out by searching for related journals using cross sectional, analytical descriptive, case studies, literature reviews, pre-clinical, and clinical trials methods. The selection of journals related to the samples used were postpartum mothers who experienced perineum due to episiotomy or spontaneous injuries as well as herbal plants that could be used as a complementary therapy, in this case including red betel leaf and aloe vera. The data extracted from the journals found are title, country, research purposes. research subject, research methods, measurement, sample, and result

The search results reached 11,509 related journals, then the scoping results found 30 journals that met the criteria with

17 national journals and 13 international journals with inclusion criteria: (a) journal with an explanation of perineal wound care using red betel leaf and/or aloe vera, (b) journal with an explanation of the results and effectiveness of red betel leaf extract and aloe vera, (c) journal available in English or Indonesian, (d) Published in the period 2011-2021. The exclusion criteria are: (a) incomplete journal content, (b) duplicate journal and (c) journal without year published.

## RESULTS

Based on the results of the study showed a total of 13 out of 30 journals that have been analyzed discuss the effectiveness of red betel leaf and aloe vera in the treatment of perineal wounds in postpartum women using the quasi experiment, true experiment and double blind methods with samples of post partum mothers who experienced perineal injuries due to episiotomy or spontaneous delivery. The average healing time using red betel leaf is

3-6 days, with a boiling technique of 25 g/5-20 betel leaves for ±5-15 minutes with a mixture of 1-6 liters of clean water, then boiled at 1000c and cooled. The results of the decoction will be evaluated for 7 days, used 2-4 times a day or every after cleaning the genital area and observation using a checklist sheet or REEDA scale.

The use of aloe vera in the treatment of perineal wounds with a gel that is applied to the wound for 7 days post partum with an average healing of 4 days. Gel measuring 5x5x1 cm can be administered directly or by compressing sterile gauze for 30 minutes at 2 hours post-partum, repeated at 6 hours post-partum, then monitored using a checklist. Interestingly, aloe vera can be given with ice gel compresses that have been stored in a 100°C freezer, packaged in sterile gauze measuring 10x8x1 cm given at 2 hours post partum for 30 minutes and repeated at 6 hours post-partum proven to be able to make the mother more relaxed. Here is diagram flow 1:

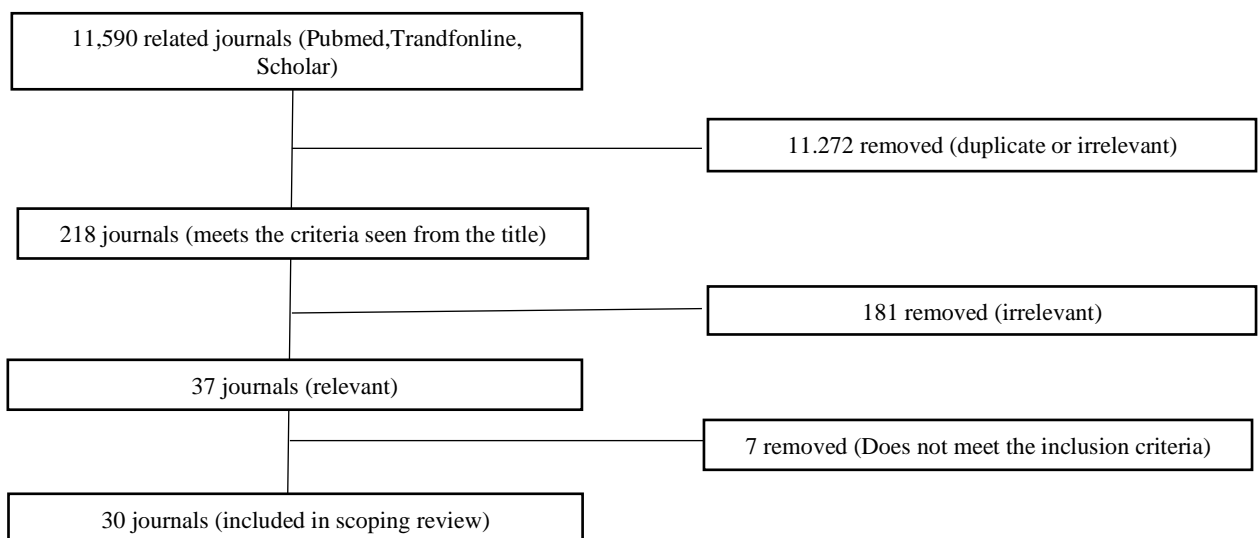


Figure 1. Diagram Flow

Figure 1 shows the results of the journal search flow from a total of 11,590 journals to 30 related studies spread across various countries such as Korea, Iran, China, Taiwan and Indonesia.

## DISCUSSION

Perineal wounds are injuries to the perineal area caused by episiotomy and lacerations in the muscular area covered with skin between the vaginal introitus and anus<sup>5,16</sup>. Wound healing is a complex process that has three phases, namely the inflammatory phase, the proliferative phase and the maturation phase<sup>9</sup>. Perineal wound healing time will last 7 -10 days and not more than 14 days<sup>6,22</sup>. Perineal wound healing can be given pharmacological and non-pharmacological therapy, one of which is complementary therapy<sup>20</sup>. Pharmacological treatment using povidone iodine which inhibits tissue granulation, damages endothelial cells, leukocytes, fibroblasts, keratinocytes, inactivates phagocytes, and separates wound edges<sup>4,27</sup>. Complementary therapies using herbs have also been applied by postpartum mothers in various regions in Indonesia due to the effects felt, one of which is believed to be able to heal wounds after childbirth<sup>12,18,19</sup>.

Indonesia is one of the countries that has high potential in the use of herbs with various benefits<sup>18</sup>. Some plants that are believed to be influential in the wound healing process include red betel and aloe vera that can be processed by boiling, using plants with palm wine, making potions, affixed directly, applied, and consumed directly<sup>6,10</sup>. Red betel has been shown to have anti-inflammatory properties and antioxidant activity<sup>26,35</sup>. The chemical constituents of 90% red betel are essential oils, hydroxykavikol, kavikol, cavibetol, allylprokatekol, carvakrol, eugenol, p-cymene, cineole, cariofelen, cadmium estragol, terpenes and phenyl propada. Carvakrol is a disinfectant and antifungal so it is used as an antiseptic medicine<sup>13,34</sup>. Red betel leaf extract is able to eat the fungus *Candida Albicans* which causes acute vaginal discharge, and itching of the

genitals, and prevents infection in wounds<sup>22,37</sup>.

Research conducted by Nila, et al (2020) the average healing time of perineal rupture using treatment with boiled water betel leaf is 8.27 days and a standard deviation of 0.704 with a minimum time of 7 days and a maximum of 9 days<sup>21</sup>. In addition, the research conducted by Rostika, et al (2020) where the provision of red betel leaves is done once a day in the morning, afternoon or evening by boiling 4-5 red betel leaves with 500-600 ml of water, boiled over medium heat for 10-15 minutes. The average perineal wound healing time after using boiled water of red betel leaf to clean the vagina (experimental group) was 5.80 days with a median of 5.00 days. The fastest was 3 days and the longest was 9 days. The results of the statistical test with an independent t test with  $\alpha = 0.05$  obtained p value = 0.001 which contained the effect of using red betel leaf boiled water on the healing time of perineal wounds at Aster Clinic, Karawang Regency in 2020<sup>14</sup>.

If you do not treat the perineal wound properly, it will affect the healing time of the wound and cause infection. Exposure to lochia and moist perineal conditions will support the proliferation of bacteria that can propagate in the bladder tract or in the birth canal which can result in the emergence of complications of bladder infections and infections in the birth canal. The use of betel leaf as a complementary therapy has proven to be effective in helping accelerate wound healing. perineum is supported by several existing studies penelitian<sup>2,13,14,21,23</sup>.

Not only betel leaf, aloe vera contains anthraquinone, allantoin, and polysaccharides and other compounds capable of inhibiting the synthesis of histamine and bradykinin inhibiting the formation of prostaglandins which will eventually prevent the inflammatory process. Aloe vera contains more than 75

potentially active ingredients including vitamins, enzymes, minerals, sugars, lignin, saponins, salicylic acid, and amino acids. Because of its rich content of these benefits, aloe vera is widely used for treatment and various pathological conditions, one of which is for wound healing<sup>17</sup>. Aloe vera extract can be used as an antibacterial due to the presence of phenolic compounds that interact with proteins in bacteria through non-specific bonds to form phenol-bacteria complexes. Aloe vera is called an antibacterial plant because the extract of aged aloe vera skin contains active substances that have been identified as saponins, sterols and acemannan which can inhibit the growth of *Staphylococcus aureus* and *Escherichia coli* bacteria<sup>11, 25,28</sup>.

Research conducted by Dewi, et al (2020) showed that the use of aloe vera gel compresses for 30 minutes at 2 hours postpartum and repeated at 6 hours postpartum<sup>17</sup>. In addition, research conducted by Anggraini showed that the fastest wound healing time in respondents who used aloe vera gel extract was the 3rd day, the longest wound healing time was the 6th day. Most wound healing was on the 4th day. While the average length of perineal wound healing of respondents who used aloe vera was 4.59 or healed on day 5. The results of the analysis using the Mann-Whitney test with  $p = 0.000$  showed that aloe vera gel was effective in healing and reduction of pain in perineal wounds<sup>11</sup>. Supported by research conducted by Eghdampour, et al (2013) which revealed a significant change in episiotomy wound on day 4 with aloe vera intervention with  $p \text{ value} = 0.0001$ <sup>30</sup>.

## CONCLUSIONS

This literature review provides an overview of several research articles and results that are relevant to the use of red betel leaf and aloe vera herbs in the treatment of perineal wounds. In 30 related articles, it can

be concluded that red betel leaf and aloe vera both contain anti-bacterial and anti-inflammatory properties so that they can be applied in the treatment of perineal wounds because they can help the healing process of perineal wounds and prevent infection.

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