ISSN 1978-6743
E-ISSN 2477-3948
Jurnal Ilmiah Kesehatan
(Journal of Health Science)
Fakultas Keperawatan dan Kebidanan | Universitas Nahdlatul Ulama Surabaya

The Effectiveness of Green Betel Leaf (Piper betle Linn) on Perineal Wound Healing: A Literature Review Study

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ARTICLE INFORMATION

Received: September, 4, 2021
Revised: January, 26, 2022
Available online: February 2022

KEYWORDS

Betel Leaf, Perineal Wound Healing; Postpartum Mothers

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A B S T R A C T

The perineal injury during delivery can increase the risk of infection in postpartum mothers. This paper reviews the effectiveness of green betel leaf (Piper betle Linn) on perineal wound healing. It was a literature review study. The first literature review stage was to determine the problem using PICO questions. Then, search and collect data/literature with the following steps: write keywords in the journal database and choose articles according to the specified criteria. The databases were Google Scholar, Science Direct, and Technology Index (SINTA), and PMC. The population was national journals examing the effectiveness of betel leaf on perineal wound healing. In addition, inclusion criteria were national journals researching the effectiveness of betel leaf on perineal wound healing and published from 2015 to 2020. Meanwhile, the exclusion criteria were journals with no full text. The journal searching was carried out from 1 to 20 August 2020. Data analysis used the following methods: critical appraisal, skimming, scanning, separating irrelevant articles from relevant articles, reading relevant articles, and making notes or summaries. Then we arranged publications in the table and analyzed them. There were seven relevant journals from Google Scholar. The findings showed that betel leaf was effective for perineal wound healing. The betel leaf contains an antiseptic five times stronger than ordinary phenol. It also contains saponins that trigger collagen formation for wound healing. Future researchers should examine the degree of the perineal wound and explain the processing of betel leaf in detail.

INTRODUCTION

Childbirth is a physiological event. Many women experience a tear in the perineum during childbirth. Half of the tears occur between the vaginal opening and the anus, outside the genitals, vagina, and cervix. Further, it often causes symptoms such as pain accompanied by heat in the infected part. If the infection has spread to the bladder tract, it will feel sore when urinating and often accompanied by fever (Oxorn, 2010).

Indonesia's maternal mortality is divided into direct and indirect obstetric causes. Direct obstetric causes include bleeding (28%), preeclampsia/eclampsia (24%), and infection (11%). Indirect obstetric causes include obstetric trauma (5%) and other causes (11%). Maternal mortality after delivery was 60%, and during the puerperium within the first 24 hours was 50%. The most cause of death during the puerperium is bleeding after delivery. Those Bleeding are caused by uterine atony (50-60%), retained placenta (16-17%), residual placenta (23-24%), lacerations in the birth canals (4-5%), and abnormalities in the birth canal (0.5-0.8%) (Depkes RI, 2014). Injury to the birth canal can occur in spontaneous or assisted delivery. The incidence of perineal rupture in mothers aged 25-30 years was 24%, while in mothers aged

https://doi.org/ 10.33086/jhs.v15.i1.2509

32-39 was 62%. Perineal rupture is the cause of postpartum hemorrhage. Further, bleeding causes 40% of maternal death (Triyanti *et al.*, 2017).

The incidence of infection in postpartum mothers is 20%, while perineal infection of 11%. Many actions have overcome this incidence, but the results have not been as expected (Manuaba, 2012). During delivery, wounds in the birth canal can be an entry point for infectious germs and commensal bacteria. Several conditions can increase the risk of infection in postpartum mothers, including perineal injury due to episiotomy, spontaneous rupture, and trauma in the fetus. Perineal wounds are localized, but they can cause systemic infection and spread to other body parts if not treated properly (Manuaba, 2012).

If there is not excellent and correct wound care in postpartum mothers, the perineal wound affected by lochia will become moist. Further, it increases the risk for the proliferation of bacteria that trigger perineal infection. Then, the infection can spread to the urinary tract and the birth canal. As a result, it can inhibit the wound healing process and cause tissue damage (Prawirohardjo, 2011). There is pharmacological and non-pharmacological perineal wound care. Pharmacological perineal wound care uses antiseptic. Meanwhile, non-pharmacological methods can use green betel leaf. (Kurniarum and Kurniawati, 2015).

Piper betle Linn is the Latin name of betel leaf. It has essential oils consisting of hydroxychavicol, cavibetol, estragole, eugenol, methyl eugenol, carvacrol. In addition, One-third of these chemical content consists of phenol. Most of it is chavicol which gives the betel leaf a distinctive odor and has five times the bacteria-killing power of ordinary phenol (Moeljanto, 2003). Betel leaf also contains saponins that can trigger the formation of collagen, a structural protein that plays a role in the wound healing process (Suratman et al., 1996 in Celly, 2010). Chavicol content in betel leaf can function as an antiseptic. In addition, chavicol and chavibetol act as antiseptics to inhibit bacterial growth in wounds (Arifin, 2008 in Celly, 2010). In addition, eugenol and chavicol in green betel leaf have antibacterial properties (Ibrahim, 2015). Much research has analyzed the effect of betel leaf on perineal wounds. However, there has been no literature review study regarding the outcomes of betel leaf on perineal wounds. This paper reviews the effectiveness of green betel leaf (*Piper betle Linn*) on perineal wound healing.

METHOD

This research was a literature review study. The first literature review stage was to determine the problem using PICO questions. Then, search and collect data/literature with the following steps: write keywords in the journal database and choose articles according to the specified criteria. The databases were Google Scholar, Science Direct, and Technology Index (SINTA), and PMC. In addition, the inclusion criteria were national journals examining the effectiveness of betel leaf on perineal wound healing and published from 2015 to 2020. Meanwhile, the exclusion criteria were journals with no full text. The journal searching began on 1 to 20 August 2020. Data analysis used the following methods: critical appraisal, skimming and

scanning, separating irrelevant articles from relevant articles, reading relevant articles, and making notes or summaries (including author, year, title, source, research objectives, research methods, results, conclusions). Then we arranged articles in the table and analyzed them.

RESULTS

There were 121 publications in Google Scholar with seven relevant articles, while there were 403 journals in Science Direct with no relevant articles. Thus, seven reports revealed the effectiveness of green betel leaf on perineal wound healing (Table 1).

Table 1. Article selection

Database	Keywords	Articles	Relevant Articles
Google Scholar	*Effectiveness* OR efektifitas AND *Piper battle linn* OR daun sirih hijau AND *healing* OR penyembuhan AND *perineal wound* OR luka perineum AND *post-partum mother* OR Ibu post-partum	121	7
Science Direct	*Effectiveness* OR efektifitas AND *piper battle linn* OR daun sirih hijau AND *healing* OR penyembuhan AND *perineal wound* OR luka perineum AND *post-partum mother* OR Ibu post-partum	403	0
Total		524	7

Table 2. Summary of literature review findings

Author, Publication Year	Title	Design	Sample	Location	Procedure	Results
(Kurniarum and Kurniawati, 2015)	The effectiveness of perineal wound healing in postpartum women using betel leaf	Quasi Experiment	Cluster sampling. 30 respondents in the intervention group (betel leaf), and 30 respondents in the control group (betadine)	Three Independent Midwifery Practices (IMPs) in Klaten	Giving betel leaf decoction to wash perineal wounds for seven days in postpartum women.	Age: 20 – 35 years = 89.3% Education = High School 35% Employment = 71.7% Primipara = 34% Wound healing in the intervention group: Dry = 22 respondents (73.3%) Wet = 8 respondents (26.7%) Wound healing in the Control group: Dry = 12 respondents (40%) Wet = 18 respondents (60%) *p*= 0.009 OR: 4.125
(Anggeriani and Lamdayani, 2018)	The effectiveness of giving betel leaf (*Piper Betel L*) on the speed of perineal	Pre-Experiment	30 respondents with purposive sampling: 15 respondents in the intervention	Sagita IMP	Betel leaf decoction every two times a day after bathing. The decoction method was 100 grams of betel leaf, added 1L of water, and cooked for 20 minutes. The authors observed	Wound healing Intervention group: 4 – 7 days (5.47 days) Control group: 6 – 8 days (7.60 days) *p*= 0.000.

https://doi.org/ 10.33086/jhs.v15.i1.2509

	wound healing in postpartum mothers		group, 15 in the control group		wounds 3,5,7,9 days after the intervention.	
(Yuliaswati and Kamidah, 2018)	Efforts to accelerate the healing of perineal wounds through the use of betel boiled water	Quasi-experiment	Forty respondents with total sampling. • 20 in the intervention group • 20 in the control group	Panjawi Maternity Hospital	Five pieces of betel leaf boiled in 1 liter of water, then waited until it was lukewarm. Respondents wiped perineal wounds with the decoction after urinating and defecating.	Age: 20 -35 years =22 (55%) Homogenity test: *p*= 0.976 Wound healing Mean in the experiment group: 5.85 (4-8 days) Mean in the control group: 6.85 (5-8 days) *p*= 0.010.
(Sari, 2017)	Comparison of wound healing perineum with and without betel leaf decoction in Lismarini Independent Midwifery Practice in 2016	Quasi-experiment	Thirty respondents with accidental sampling. 15 respondents with betel leaf decoction (intervention group) and 15 without betel leaf decoction (control group)	Lismarini IMP	The authors boiled five pieces of betel leaf in 1 liter of water and waited until lukewarm. Respondents wiped their perineal wound with betel leaf decoction from front to back parts of the wound after bathing, urinating, defecating	In the intervention group: Fast healing = 11 people (36.7%), Normal healing = 4 people (13.3%), and slow healing = 0 people In the control group: Fast healing = 0 people, Normal healing = 7 people (33.3%), and slow healing = 8 people (16.7%). *p*= 0.000.
(Sitepu, Hutabarat and Natalia, 2020)	Effect of Green Betel Leaf Decoction on Perineal Wound Healing in Post Partum Mothers	Pre-experimental	31 respondents with the consecutive sampling	Pera Simalingkar B Clinic, Medan Tuntungan District, Medan	The authors used green betel leaf decoction. They observed the degree of the perineal wound before and after the intervention.	Age >30 years= 16 respondents (51.6%) Senior high school= 24 respondents (77.4%) Working= 29 respondents (93.5%) Pre-test: Degree 0= 16 respondents (51.6%) Degree 1= 15 respondents (48.4%) Posttest: Degree 0= 26 respondents (83.9%) Degree 1= 5 respondents (16.1%) *p*= 0.018
(Christina and Kurniyanti, 2014)	The Effectiveness of Betel Leaf Decoction in Accelerating the	Completely randomized design (CRD) to find the highest chavicol	19 respondents	Independent Midwifery Practices in Malang Regency	The first stage: Some green betel leaves were dried in an oven with a temperature of 60ºC (treatment 1) to produce dry betel leaves with a water content of 14% and	The highest chavicol content was in betel leaf decoction with a boiling time of 20 minutes. After giving betel leaf decoction with the highest chavicol content, the

https://doi.org/ 10.33086/jhs.v15.i1.2509

	Healing of Perineal Wounds	content. Then, Quasi-experiment to determine the outcome of the highest chavicol content on perineal wound healing			partly without drying (treatment 2). The two treatments were dried again to make paste and starch. Then, the drying results were boiled with water at a temperature of 100ºC for 10 minutes, 15 minutes, and 20 minutes. Each result of the boiling time interval was separated between the dregs and the extraction results to produce different chavicol extractions. Furthermore, the chemical test of chavicol was carried out to determine the highest levels of chavicol from the three-time groups. The second stage was the implementation of experiments using betel leaf decoction with the highest chavicol content in the perineal wound among postpartum mothers.	respondent's perineal wound healed and dried up in 3-4 days postpartum. In addition, there were no signs of infection. Furthermore, respondents reported that the pain in the perineal suture wound also quickly decreased. Thus, betel leaf was effective in perineal wound healing (p=0.000).
(Kurniawati and Ulfa, 2015)	The Differences of The Using of Betel Leaves to recover The Perineum Wound	True Experimental Design	Sixteen respondents with purposive sampling. Eight respondents were in the intervention group (betel leaf) and 8 in the control group.	Ringinanyar Village	The authors used betel leaf decoction. The tools and materials were betel leaf, boiling water, one measuring cup, and one basin. Data collection techniques were observing time in the wound healing process until the wound dries and using standard operating procedures of perineal care.	There was a difference in perineal wound healing time between intervention and control groups (p=0.000).

DISCUSSION

Location

All studies were carried out in Indonesia – 71.4% in IMPs, 14.3% in a clinic, and 14.3% in the village. The research location is where the researchers obtain information about the data and conducts the research. Place selection should consider attractiveness, uniqueness, and suitability for the chosen topic so

that researchers can find meaningful and new things (Muchtar, 2015). In addition, it can explain the characteristics of the community/respondents in the research. In this paper, there were no journals that used two research locations. Thus, the study results were not biased due to differences in the characteristics of respondents from two different places.

Research Design

The research design in this paper was two journals with quasi-experimental design (28.5%), two with pre-experimental (28.5%), two with experimental (28.5%), and one with true experimental (14.3%). The research design is a method or strategy to obtain data and facts processed for research purposes (Sugiyono, 2010). It is an overview of the research that researchers will carry out to achieve specific goals (Indrawan and Yuniawati, 2014). All journals in this literature review used an experimental design, with or without the control group. This design was based on the research objectives because the experimental design can determine the effects of the therapy/treatment. The treatment is given by the same person and technique, so that effects could be measured properly and minimized bias.

Sample

The sampling techniques in this paper were one journal (14.3%) with cluster sampling, two journals (28.5%) with purposive sampling, one journal (14.3%) with total sampling, one journal (14.3 %) with accidental sampling, and no description in 2 journals (28.5%). The average sample used in this literature review was 16 – 70 respondents. The population is a collection of subjects, variables, concepts, or phenomena. Each sample member determines the population's nature (Morissan, 2012). In addition, the sample is part of the population or part of the characteristics of the population (Hidayat, 2018). The population in the research journal follows the sampling procedure. The advantage of using samples in research are cost and time savings. In addition, the data is more accurate because the authors do not involve too many respondents.

Betel leaf

All journals in this literature review used green betel leaf (100%) – 6 journals (85.7%) washed the perineal wound with betel leaf decoction, and one journal (14.3%) did vulva hygiene with betel leaf. The betel plant has been used for various kinds of treatment. Almost all parts of the betel plant can be used, such as roots, stems, stalks, leaves, and fruit (Chakraborty, A. K., Rhambade and Patil, 2011). Betel plant decoction is medicine for impetigo, eczema wounds, burns, lymphangitis, furunculosis, and stomach pain. In addition, betel leaf can heal urticaria, pharyngitis, and swelling. The roots and fruit of the betel plant can be used to treat malaria and asthma (Dwivedi and Shalini, 2014) (Triyanti *et al.*, 2017)

Betel leaf contains various substances to neutralize the imbalance of acid-base metabolism in the body, such as Si, Cl, Zn, Mg, Ca, and K (Periyanayagam, Mubeen, and Basha, 2014). The content of betel leaf is very much metabolites such as volatile oils (safrol, eugenol, eugenol methyl ester, isoeugenol),

phenolic components (chavicol, hydroxyl chavicol), hydroxyl fatty acids (stearate, palmitic, myristic acid), and fatty acids (stearic and palmitic). That content has antibacterial effects (Bangash *et al.*, 2012). Not all of the processing of the betel leaves in the seven journals are explained in detail. Overall, that processing by boiling directly, and some are extracted first and then boiled. The different ways of processing betel leaves will have other content produced. However, the content was still effective and had better perineal wound healing outcomes than the control group.

Perineal Wound

In this paper, most journals did not mention the degree of the perineal wound in their studies. In addition, the authors observed perineal wounds on the first, fifth, seventh, and ninth days. A perineal wound is an injury in the perineum caused by a tear in the birth canal due to an episiotomy or rupture during delivery (Purwoastuti and Walyani, 2015). It is an injury in the urogenital diaphragm and levator ani muscle during delivery. It is not visible because the injuries occur in the perineal skin or the vagina. Further, it can weaken the hip base so that it is easy for genital prolapse occurs (Rukiyah and Yulianti, 2014). Wounds on the perineum are classified in several degrees, namely degrees 1 to 4. Each degree has a different area and depth of the injury. The observation of perineal wounds can be appropriately measured by examining the degree of the wound.

The Effectiveness of Green Betel Leaf Against Perineal Wound Healing

All journals (100%) showed the effects of betel leaf on perineal wound healing in postpartum mothers. Betel leaf contains chemical content consisting of hydroxychavicol, chavibetol, estragole, eugenol, methyl eugenol, carvacrol. Those contents have five times the bacteria-killing power of ordinary phenol. In addition, chavicol and chavibetol are substances that function as antiseptics that can inhibit the growth of bacteria in wounds (Arifin 2008 in Celly, 2010). Betel leaf also contains saponins that stimulate collagen formation, which plays a role in wound healing (Suratman et al., 1996 in Celly, 2010). A study by Celly (2010) showed the effect of betel leaf on the acceleration of perineal wound healing among postpartum mothers in Sumbermulyo Village, Jogotoro District, Jombang.

Perineal wound care can prevent infection in birth canal injuries. Using betel leaf decoction is one of the non-pharmacological perineal wound cares. Betel leaf contains antifungal, antibacterial, and antibiotic therapeutic effects. In addition, there is an arecoline to help activate the central nervous system. So that peristaltic motion and blood circulation in the wound area increase. In addition, it can improve oxygenation, so that wound healing becomes faster. The betel leaf's chemical contents and properties can support perineal wound healing because containing an antiseptic five times stronger than ordinary phenol. It also contains saponins that trigger collagen formation for wound healing. So, using betel leaf decoction can cause perineal wounds to heal faster than without using betel leaves.

https://doi.org/ 10.33086/jhs.v15.i1.2509

CONCLUSION

All journal articles revealed that betel leaf (*Piper betle Linn*) was effective for perineal wound healing with a $p<0.05$. Using betel leaf as a complementary therapy must be supported by good personal hygiene and adequate nutritional intake so that the wound can heal properly and infection does not occur. Future researchers should examine the degree of the perineal wound and explain the processing of betel leaf in detail.

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