STRADA : Jurnal Ilmiah Kesehatan
DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

The Effect of Aloe Vera and Betel Leaf Ointment (Piper Betler L.) on the Healing of Perineal Wounds

Halimatus Saidah[1*], Putri Wahyu Wigati[2], Nur Fahma Laili[3]
[1,2] DIII Midwifery Study Program, Faculty of Health Sciences, Universitas Kadiri, Indonesia
[3] Pharmacist Study Program, Faculty of Health Sciences, Universitas Kadiri, Indonesia
*Corresponding author: halimatus.saidah@unik-kediri.ac.id

ABSTRACT

Perianal wounds are tears in the perineal tissue that occur due to the birth canal, either spontaneously torn or episiotomy. A combination of aloe vera and betel leaf (Piper betle L.) can be used as an alternative healing agent for perineal wounds. The purpose of this study was to determine the effect of aloe vera and betel leaf ointment on perineal wound healing. The study design was a quasi-experimental study, with a population of postpartum women on day 1 (second-degree perineal wounds) and a sample size of 32. The research instrument used a REEDA scale observation sheet. The results of the study using an independent T-test obtained a p-value of 0.025 (<α 0.05), indicating an effect of Lisih ointment (aloe vera and betel leaf) on perineal wound healing. Based on the Mann-Whitney U test, differences in the perineal wound healing process were seen on day 6 with a P-value of 0.001. Lisih ointment can be used as an alternative complementary treatment that utilizes natural ingredients to accelerate perineal wound healing.

Keywords: aloe vera, betel leaf, healing, ointment, perineal wound

Received September 7, 2025; Revised October 12, 2025; Accepted November 14, 2025

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

BACKGROUND

A perineal tear is a wound to the perineum, vulva, and vagina that occurs during childbirth. Tears can occur either spontaneously or as a result of an episiotomy. (The Thi Lien 2025 and Firdaus, (2023). Data on the incidence of perineal tears is not available globally, but several studies have described the incidence of perineal tears during childbirth. The incidence of perineal tears in Thailand is 2.9% (1.7% wound infection and 1.2% wound dehiscence). The incidence of perineal tears in Iran is 84.3%, with 50% of women being primiparous. The incidence of perineal tears in Indonesia is 75.70%, and most are found in mothers under 20 years of age, primigravida, preterm pregnancies, macrosomia, and vacuum-assisted deliveries (Sismeri, 2023).

Based on a preliminary study conducted at the Ngasem Community Health Center in Kediri Regency, East Java, data from two months (January to February 2025) showed that 147 postpartum women experienced perineal injuries, including episiotomy and spontaneous tears. Of the 10 postpartum women who experienced perineal tears, 6 (60%) healed within 7 days, with inflammation, redness, and pain. Four (40%) healed more quickly, in less than 7 days (Data from Ngasem Community Health Center, 2025).

Causes of delayed perineal wound healing include economic factors, maternal knowledge about perineal wound healing, cultural factors, and factors within the mother herself (malnutrition, smoking, lack of sleep, stress, medical conditions and therapy, suboptimal wound cleaning, an unclean environment, and infection) (Astuti, 2020).

Perineal wounds can be the initial source of infection in postpartum mothers. This is due to the open tissue, which allows germs and bacteria to easily enter. The incidence of infection is 0.1-23.6% in postpartum mothers (Indonesian Ministry of Health, 2020).

The increased risk of perineal wound infection is also due to the length of healing time. The longer the healing process, the greater the risk of wound exposure to microorganisms. Infection is a leading cause of direct death, along with hemorrhage and eclampsia. The frequency of postpartum infections is approximately 45%, with infections of the perineal wound/birth canal accounting for approximately 25% to 55% (Astuti, (2020).

Signs of perineal wound infection include perineal pain, a ruptured perineal wound, and purulent vaginal discharge. Postpartum mothers are often afraid to clean their perineal wounds due to discomfort caused by stitches in the birth canal. Common management practices for perineal wound care include dry cleaning by washing the perineal wound and scrubbing it with soap, and the use of pain-relieving medications (Dona, 2022).

Examination results obtained from mothers with perineal wound infections revealed 100% E. coli, 33.3% Staphylococcus bacteria, and 33.3% Acinetobacter sp. E. coli bacteria are often found in the perineal wounds of postpartum mothers with delayed healing. E. coli bacteria act as pathogens in perineal wounds and can cause wound infections (Astuti, 2020).

Aloe vera leaf extract can inhibit the growth of Staphylococcus aureus bacteria because aloe vera leaves contain bioactive compounds that function as antibacterial agents. The anthraquinone and saponin content in aloe vera leaves is bactericidal, capable of inhibiting the gram-positive bacteria Enterococcus bovis and Staphylococcus aureus, and the gram-negative bacteria Escherichia coli, Pseudomonas aeruginosa, Morganella morganii, Proteus mirabilis, and Proteus vulgaris (Azzahra, 2021). Betel leaves (Piper betle L.) can inhibit the growth of Staphylococcus aureus. The content of essential oils, flavonoids, saponins, and tannins function as antibacterials. The chemical compounds and antibacterial activity of betel leaf can inhibit gram-positive bacteria (Staphylococcus aureus, Bacillus subtilis, and Lysteria monocytogenes) and gram-negative bacteria (Salmonella typhimurium, Escherichia coli, and Pseudomonas psedomallaei) (Azzahra, 2021).

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

A single extract of aloe vera and a single extract of betel leaf had lower inhibitory activity against bacteria compared to the combination of the two extracts. When two antimicrobial agents act simultaneously on a homogeneous microbial population, the effect can be synergistic, meaning the combined effect is significantly greater than the sum of the two effects. The concentration of aloe vera and betel leaf extracts from various treatments resulted in variations in the diameter of the inhibitory activity. The interaction between the concentration of aloe vera and betel leaf extracts on the diameter of the inhibitory activity against Staphylococcus aureus was investigated (Azzahra, 2021).

Ointments are an alternative to accelerate perineal wound healing because they are considered more practical and easier for postpartum mothers to use.

Perineal wound care to prevent bacterial growth can be done traditionally, based on local wisdom, which is proven safe and can accelerate perineal wound healing. These plants are also easily available locally, namely aloe vera and betel leaves.

Based on this research, a study was conducted on "The Effect of Lisih Ointment (Aloe Vera) and betel leaves (Piper betle L.) on perineal wound healing."

METHODS

The design of this study is a two-pretest posttest with control group design, to determine the effect of aloe vera and betel leaf ointment (piper betle l) on perineal wound healing. The population in this study was all postpartum mothers on the first day who experienced second-degree perineal wounds in the Ngasem Community Health Center Working Area, Kediri Regency. The research sample was taken using the infinite formula to obtain a sample size of 32 divided into 16 for the intervention group and 16 respondents for the control group. The sampling technique used Purposive Sampling, namely taking samples that meet the criteria set by the researcher, namely inclusion criteria (All postpartum mothers who have second-degree perineal wounds, are willing to be respondents), exclusion criteria are (Mothers who experience postpartum complications such as bleeding, mothers do not follow research procedures, mothers experience pain), the research instrument uses a perineal wound healing observation sheet using the REEDA Score. The intervention group in the study was given Lisih ointment treatment (aloe vera and red betel leaf) in the intervention group, the intervention was given for 7 days (day 1 to day 7) given ointment 2X1 at 07.00 WIB and 19.00 WIB; while the control group was given perineal wound care by washing the perineum with soap and running water. Data analysis used the T Test to determine the effect of Lisih ointment on perineal wound healing while knowing the difference in effectiveness seen from day was done using the Man Whitney Test.

RESULTS

1. Characteristics of Respondents in the Intervention and Control Groups

Table 1. Characteristics of Respondents in the Intervention and Control Groups

Variables	Group Treatment		Control Group	
	f	%	f	%
Age				
<20 Years	2	13	4	25
21-35 Years	11	69	8	50
>35 Years	3	19	4	25
Amount	**16**	100	**16**	100
Job				

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

Housewife	6	38	9	56
Self-employed	8	50	2	13
Private	2	13	3	19
Civil Servant	0	0	2	13
Amount	**16**	**100**	**16**	**100**
		Education		
Elementary School	1	6	0	0
Junior High School	3	19	4	25
Senior High School	8	50	9	56
College	4	25	3	19
Amount	16	100	16	100
		Parity		
Primipara	6	38	5	31
Multipara	10	63	11	69
Amount	16	100	16	100
		Food Taboos		
Food Taboos	0	0	0	0
No Food Abstinence	16	100	16	100
Amount	**16**	**100**	**16**	**100**

Based on table 1, the characteristics of respondents in the intervention and control groups are as follows: In the intervention group, more than half (69%) were aged 21-35 years, half (50%) were self-employed, half (50%) had a high school education, more than half (63%) were multiparous, and all (100%) did not experience dietary restrictions. The characteristics of respondents in the control group were as follows: Half (50%) were aged 21-35 years, half (50%) were self-employed, more than half (69%) had a high school education, more than half (65%) were multiparous, and all (100%) did not experience dietary restrictions.

Based on these respondent characteristics, no differences were found between the intervention and control groups..

2. Distribution of Healing from Day 1 to Day 7 in the Intervention and Control Groups

Table 2. Distribution of Healing from Day 1 to Day 7 in the Intervention and Control Groups

Wound Healing	**Group Intervention (n=16)**						**Group Control (n=16)**					
Day to-	**Good (Reeda Scale Number 0)**		**Not good (Reeda Scale Number 1-5)**		**Bad (Reeda Scale Number >5)**		**Good (Reeda Scale Number 0)**		**Not good (Reeda Scale Number 1-5)**		**Bad (Reeda Scale Number >5)**	
	f	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**	**F**	**%**
1	0	0	0	0	16	100	0	0	0	0	16	100

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

2	0	0	0	0	16	100	0	0	0	0	16	100
3	0	0	16	100	0	0	0	0	13	81.25	3	18.75
4	0	0	16	100	0	0	0	0	16	100	0	0
5	13	81.25	3	18.75	0	0	6	37.5	10	62.5	0	0
6	16	100	0	0	0	0	8	50	8	50	0	0
7	16	100	0	0	0	0	12	75	4	25	0	0

Based on table 2 regarding the Distribution of Healing from Day 1 to Day 7 in the Intervention Group and the Control Group, it is known that the difference in perineal wound healing in the intervention group and the control group was seen on day 5. On day 5 in the intervention group, almost all (81.25%) of the wounds healed well (score 0 using the REEDA scale assessment), while in the control group more than half (62.5%) of the wounds healed poorly (score 1-5 using the REEDA scale).

2. Data Normality Test in the Intervention Group and Control Group

The homogeneity test is an assumption test that aims to determine whether the samples studied have the same abilities. The homogeneity test uses the Kolmogorov-Smirnov test using Statistical Product and Service Solutions (SPSS) software. The results of the data homogeneity test are shown in Table 3 below:

Table 3. Normality Test

Day To.	Inter Group	Control Group
	p* value	p* value
1	0,000	0,000
2	0,000	0,000
3	0,000	0,000
4	0,000	0,000
5	0,000	0,000
6	0,000	0,000
7	0,000	0,000

***Uji Kolmogorov-Smirnov

Based on table 3, the results of the homogeneity test using the Kolmogorov-Smirnov test obtained a value of $\rho < \alpha$ 0.05, so it can be concluded that the data is not normally distributed.

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

3. Effect of Lisih Ointment (Aloe Vera) and Betel Leaf (Piper Betle L.) on Perineal Wound Healing

Table 3. Effect of Lisih Ointment (Aloe Vera) and Betel Leaf (Piper Betle L.) on Perineal Wound Healing

Reeda Scale	Group			
	Intervention		Control	
	f	%	F	%
Good	16	100	12	75
Not enough	0	0	4	25
Bad	0	0	0	0
Amount	10	100	10	100

Based on table 3 regarding the effect of Lisih ointment (Aloe vera and Betel Leaf (Piper Betle L). The results of data analysis using the independent T-test obtained a P value of 0.025, p value <α (0.05), so it was concluded that there was an effect of Lisih ointment (aloe vera and betel leaf) on the healing of perineal wounds.

4. Differences in Wound Healing in the Intervention and Control Groups (Observations from Day 1 to Day 7)

Table 4. Differences in Wound Healing in the Intervention and Control Groups (Observations from Day 1 to Day 7)

Day To.	p* value
1	1,000
2	1,000
3	0.073
4	1,000
5	0.13
6	0.001
7	0.035

**Mann-Whitney U test*

Based on table 5 regarding the differences in perineal wound healing in the intervention group and the control group based on the Mann-Whitney U test, the differences in the perineal wound healing process were seen on day 6 with a P value of 0.001 (<α 0.05), while the first to fifth days did not show any differences.

DISCUSSION

The results of this study indicate that the administration of Lisih ointment (a combination of aloe vera and betel leaf extract) significantly affected the perineal wound healing process. An independent t-test analysis yielded a p-value of 0.025 (<0.05), indicating a significant difference in wound healing between the intervention and control groups. Furthermore, the Mann-Whitney U test showed that the difference in the perineal wound healing process began to become apparent on day 6 (p=0.001), while there was no significant difference between days 1 and 4.

The perineal wound healing process generally proceeds through three phases: the inflammatory phase (0–3 days), characterized by edema, redness, and pain; the proliferation

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

phase (days 4–21), characterized by the formation of granulation tissue, fibroblasts, and collagen; and the maturation/remodeling phase (>21 days), where wound closure becomes more complete (Robbins & Cotran, 2019). The results of this study align with this theory, stating that from days 1 to 4, perineal wounds are still in the inflammatory phase, so no significant differences are visible. Differences begin to appear on day 6 because Lisih ointment (Aloe vera from betel leaf) accelerates the proliferation phase through its bioactive compounds.

The proliferation phase typically lasts from days 4 to 21 after wounding. This phase involves granulation tissue formation, fibroblast proliferation, collagen synthesis, angiogenesis, and epithelialization, accelerating wound healing (Robbins & Cotran, 2019). Therefore, interventions that increase fibroblast activity, collagen, and angiogenesis will accelerate wound healing.

Aloe vera is known to contain polysaccharides (acemannan), vitamins C, E, and antioxidant compounds that play a role in accelerating wound epithelialization, stimulating fibroblasts, and increasing collagen synthesis (Surjushe et al., 2008). Furthermore, aloe vera has anti-inflammatory effects that reduce excessive leukocyte infiltration, thus optimizing the healing process. Bioactive compounds such as acemannan (a polysaccharide) have been shown to stimulate fibroblast proliferation and type III collagen synthesis, thus accelerating the formation of granulation tissue (Surjushe et al., 2008). Furthermore, aloe vera also contains vitamins C and E, which act as antioxidants, protecting new tissue from oxidative stress, as well as phytohormones such as gibberellin and auxin, which can stimulate angiogenesis and epithelialization (Hamman, 2008). Through this mechanism, aloe vera accelerates the proliferation phase of perineal wound healing. Betel leaves contain phenols, flavonoids, eugenol, and chavicol, which have antimicrobial, antiseptic, and antioxidant properties (Prabhu & Krishnamoorthy, 2013). Betel leaves contain flavonoids, phenols, eugenol, chavicol, and tannins, which have antimicrobial, antiseptic, antioxidant, and astringent properties (Prabhu & Krishnamoorthy, 2013). Flavonoids aid tissue regeneration, while chavicol and eugenol function as antiseptics, preventing bacterial colonization in wounds. Tannins act as astringents, accelerating wound contraction. Thus, betel leaves keep wounds sterile and facilitate the granulation and epithelialization phases (Handayani, 2019).

Aloe vera is effective in killing gram-positive (75%) and gram-negative (100%) bacteria. The protease enzyme, along with glucomannan, found in aloe vera, can stimulate fibroblasts for wound healing. These elements in aloe vera, when combined, can stimulate macrophages, which control the immune system. Furthermore, aloe vera mucus contains vitamins E and C, as well as several amino acids not found in other plants commonly used for wound healing, such as binahong, which is beneficial as a powerful antioxidant in wound healing. Aloe vera is particularly well combined with betel leaves because they both have antimicrobial properties (Dainty, 2022).

Previously, an in vitro test was conducted on the interaction of aloe vera and betel leaves on the inhibitory effect of Staphylococcus aureus. The results showed an interaction between the concentration and type of aloe vera and betel leaf extracts on the inhibitory effect of Staphylococcus aureus (Dainty, 2022).

One effort to simplify the use of this ingredient is to create an ointment preparation. Ointments are semi-solid preparations intended for topical application to the skin and mucous membranes. Topical ointments are chosen because they are easy to use and best suited for therapeutic purposes (Indonesian Ministry of Health, 2020).

The combination of aloe vera and betel leaf in Lisih ointment provides a synergistic effect: aloe vera accelerates tissue regeneration, while betel leaf prevents bacterial colonization in wounds.

Perineal wound healing was assessed using the REEDA scale (Redness, Edema, Ecchymosis, Discharge, Approximation) observation sheet developed by Davidson (1974).

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

Redness was reduced due to the anti-inflammatory effects of aloe vera (Surjushe et al., 2008), edema (swelling) was reduced due to the anti-inflammatory and astringent effects of betel leaves (Prabhu & Krishnamoorthy, 2013), ecchymosis (bruising) disappeared more quickly due to improved microcirculation, discharge (secretions/exudates) was reduced because betel leaves prevented bacterial growth (Handayani, 2019), and approximation (wound edge meeting) was achieved more quickly due to increased collagenization by acemannan in aloe vera (Hamman, 2008).

Therefore, the combination of aloe vera and betel leaves (Lisih ointment) significantly accelerated the reduction in REEDA scores starting from the proliferation phase.

This was also explained in the study. Handayani (2019) reported that betel leaf extract is effective as a natural antiseptic, reducing the risk of infection in perineal wounds. Recent research by Rahman et al. (2021) also stated that a combination of herbal ingredients with anti-inflammatory and antimicrobial properties can accelerate postpartum wound healing.

These study results are consistent with previous findings that the use of natural ingredients such as aloe vera and betel leaf can accelerate wound healing. A significant difference in time (day 6) indicates that the inflammatory phase progressed normally in both groups, but the proliferative phase was faster in the intervention group with Lisih ointment (Aloe Vera and Betel Leaf).

CONCLUSION

Lisih ointment (aloe vera and betel leaf) has an effect on perineal wound healing. The difference in perineal wound healing between the intervention group given Lisih ointment (aloe vera and betel leaf) and the control group (mothers washed the perineal wound with running water) showed a difference in the perineal wound healing process on day 6, while no difference was observed between days 1 and 5.

Lisih ointment can be an alternative complementary therapy using relatively safe and inexpensive local ingredients to accelerate perineal wound healing. This effectiveness is likely due to the combined anti-inflammatory, antioxidant, and antimicrobial effects of the ointment and aloe vera.

REFERENCES

Abedzadeh-Kalahroudi, M. et al. (2019). Perineal trauma: incidence and its risk factors', Journal of Obstetrics and Gynaecology: The Journal of the Institute of Obstetrics and Gynaecology.39(2): 206–11. Available at: https://doi.org/10.1080/01443615.2018.1476473

Astuti, P. (2020). Aktivitas Ekstrak gel Aloe vera sebagai Anti Inflamasi untuk Mempercepat Proses Penyembuhan Luka Pada Tikus Sprague Dawley. Jurnal Ilmiah Umum Dan Kesehatan Aisyiyah. 5(1): 50–5.

Az-Zahra, S., Hidayah, S. A. N., dkk. (2021). Potential Compound Extract from Carica Pubescens on Gingiva Incision Wound Healing: Through Proliferation, Differentiation and Immuno Response Medical and Health Journal.[S.l.], v. 1, n. 1, p. 11-21, aug.2021. ISSN 2807-3541. Available at

Cakwira, H. et al. (2022). The clinical characteristics of perineal tears: A study carried out on 14 pregnant women in a tertiary center: Case series', Annals of Medicine and Surgery. J.amsu. 82, p. 104432. https://doi.org/10.1016/j.amsu.2022.104 432

Dainty M, Renny D dkk. (2022). Eketivitas Penggunaan Lidah Buaya (Aloe Vera) Terhadap Penyembuhan Luka Perineum pada Ibu Nifas di Wilayah Kerja Puskesmas Karang Anyar Lampung Selatan. Jurnal Ilmiah Bidan. 6(3):25-32.

Data Puskesmas Ngasem 2025.

DOI: https://doi.org/10.30994/sjik.v14i2.1290
ISSN: 2252-3847 (print); 2614-350X (online) Vol.14 No.2 November 2025 Page. 277-285

Dona, S., Anggraini, H., & Friscilla, I. (2022). Intervensi Perawatan Luka Perineum Pada Ibu Postpartum : Literature Review. Procceding Of Sari Mulia University Midwifery National Seminars. 4(1). Hal 50–5.

Firdaus M, Nurul H, Ziadatun M. (2023). The Effectiveness Of Red Betel Leaf And Aloe Vera In The Treatment Of Perineal Wounds: Literature Review. International Journal of Nursing and Midwifery Science (IJNMS). 7(2), 208–15.

Halimatus S, Dewi K dkk. (2022). The Effectiveness of Infusa Leaf of Binahong (Anredera Codifolia) in Healing Perineal Wound. Journal for Quality in Public Health.5(2):537-44.

Handayani, T. (2019). Efektivitas daun sirih dalam mempercepat penyembuhan luka perineum. *Media Kesehatan*.

Herliyana, L., Purnamayanti, A. and Prasetyadi, F.O.H. (2022). Delivering a Birth Safely – Case Reports of Perineal Infection Prevention among Pregnant Women Living Around Ex-landfills', Jurnal Farmasi Dan Ilmu Kefarmasian Indonesia. 9(2): 131–7. https://doi.org/10.20473/jfiki.v9i22022.1 31-137.

Isnaeni, D. (2019). Formulasi Sediaan Salep Ekstrak Daun Kaktus Pakis Giwang (Euphorbia milii Ch.Des Moulins) Kombinasi Basis Modifikasi PEG 4000 Dan PEG 400 serta Aktivitas Antibakteri Terhadap Staphylococcus epidermis. Jurnal Herbal Indonesia. 1(1): 2685–9343

Kemenkes RI. (2020). Farmakope Indonesia edisi VI. In Departemen Kesehatan Republik Indonesia (Edisi VI). 2020. Kementerian Kesehatan RI.

Kemnkes RI. Angka Kematian Ibu. (2020).

Larasati, D., Istiqomah, F., & Hernowo, B. (2022). Evaluasi Sifat Fisik Salep Kunyit (Curucuma domestica) dengan Variasi Konsentrasi Vaselin Album. Jurnal Kesehatan Madani Medika.13(01): 93–9.

Prabhu, K., & Krishnamoorthy, M. (2013). Therapeutic uses of Piper betle Linn. *International Journal of Pharmaceutical & Biological Archive*, 4(2), 238–243.

Rahmawati. (2022). Interaksi ekstrak daun lidah buaya (*aloe vera l*) dan daun sirih (Piper betle L.) terhadap daya hambat Stapylococcus aureus secara in vitro. Jurnal Edubio Tropika. 2(1): 121-7.

Ramar, C.N. and Grimes, W.R. Perineal Lacerations', in StatPearls [Internet]. (2022). StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NB K559068/

Sismeri D, Siti A, Dwi R. (2023). Identifikasi penyembuhan luka perineum menggunakan skala reeda pada ibu yang diberikan teh kalakai. Dinamika Kesehatan Jurnal dan Keperawatan. 14(2); 310–8.

The Thi Lien, Nguyen, at all. (2025). Influence of phytochemicals in piper betle linn leaf extract on wound healing. Crosh Mack. Researche Article. 2025;3(23). 3-8.

Yuliani, D. (2017). Pengaruh gel Aloe vera terhadap penyembuhan luka perineum pada ibu nifas. *Jurnal Kebidanan Indonesia*. 2(3); 10–8.