



**THE EFFECT OF PROCESSED KERSEN (*MUNTINGIA CALABURA L.*) LEAF PRODUCTS ON PERINEAL WOUND HEALING IN POSTPARTUM WOMEN IN THE WORK AREA OF THE CILEDUG PUBLIC HEALTH CENTER, CIREBON IN 2021**

**Siti Saadah Mardiah<sup>1</sup>, Sariesty Rismawati<sup>2</sup>, Ida Apriani<sup>3</sup>, Sri Gustini<sup>4</sup>, Wawan Rismawan<sup>5</sup>**

<sup>1,2,3,4</sup>Department of Midwifery, Poltekkes Kemenkes Tasikmalaya, Indonesia

<sup>5</sup>BTH University Cilolohan Street No.36 Tasikmalaya City  
Jl. Cilolohan No.35, Tasikmalaya, West Java, Indonesia

Corresponding author: Wawan Rismawan

Email: wawanrismawan@universitas-bth.ac.id

Received: written by editor; Revised: written by editor; Accepted: written by editor

---

## ABSTRACT

Infection is one of the complications that often occur during postpartum period, which can be caused by improper perineal wound care. Therefore, it is extremely necessary to treat perineal wounds properly. The purpose of this study is to determine the effect of processed Kersen (*Muntingia Calabura L.*) leaf products on perineal wound healing in postpartum mothers. The analysis applied a quasi-experimental method with the posttest-only control group design, in which there were a treatment group (intervention) consisting of postpartum mothers who drank processed Kersen leaf products and a control group containing postpartum mothers who did not receive any intervention. A total of 38 people were selected as respondents through purposive sampling. The REEDA scale was chosen as an instrument for assessing perineal wound healing. The obtained data was then analyzed using the Chi Square test. The results of the study showed that 19 people in the treatment group (100%) experienced a rapid healing process. Meanwhile, 6 people in the control group (31.6%) had a rapid healing process, whereas the remaining 13 people (68.4%) experienced a normal healing process. Furthermore, the results of the analysis using the Chi-Square test obtained  $p\text{-value} = 0.000$  ( $p < 0.05$ ), meaning that  $H_a$  is accepted. Therefore, it can be concluded that there is a significant effect of processed Kersen leaf products on perineal wound healing.

Keywords: Kersen (*Muntingia calabura L.*) Leaves; Perineal Wound Healing

---

## Introduction

Postpartum period begins after childbirth is complete and ends when the uterine organs return to their pre-pregnancy state which lasts for 6 weeks. It is the most important period for monitoring as it will result in death if there is any negligence [1].

Based on the 2019 West Java Provincial Health Profile Report, the postpartum period is a great contributor to maternal mortality, with the highest percentage occurring in mothers at risk of lethal bleeding or infection. A total of 684 maternal deaths occurred during pregnancy

(18.7%), childbirth (22.95%), and postpartum period (48.2%) [2].

Postpartum infections often occur during postpartum period. One of the causes of this infection is perineal laceration, which can occur spontaneously or as a result of an episiotomy with certain indications.

In 2009, there were 2.7 million cases of perineal laceration during childbirth worldwide. In Asia, cases of perineal laceration are quite plenty; 50% of the incidences of perineal lacerations in the world happen in Asia. Perineal laceration is experienced by 85% of women having vaginal

delivery [3]. Careful attention is needed for perineal laceration as it can cause female reproductive organ dysfunction or be a source of bleeding or infection, which can then lead to death from sepsis or hemorrhage [4].

In West Java, cases of perineal laceration occur in almost 90% of all mothers during childbirth [2]. Based on the results of a survey conducted by the researchers at Puskesmas Ciledug (the Ciledug Public Health Center), of all women who gave birth in 2020, 70% of them experienced perineal laceration (65% spontaneous and 5% due to episiotomy) [5].

Perineal laceration may result in infection during postpartum period, which is a major cause of maternal morbidity and mortality. Postpartum infection may be caused by improper perineal wound care. To prevent this, proper perineal wound care and treatment are highly needed. Various methods to treat perineal wound pain can be done either pharmacologically or non-pharmacologically, with pharmacological pain management being more effective than non-pharmacological one. However, pharmacological treatments have the potential to produce several side effects; for example, administering mefenamic acid analgesic can cause stomach pain. In addition, pharmacological pain management is also at risk of causing allergic reactions and/or diarrhea in infants since the drugs may enter the bloodstream and pass into breast milk. Meanwhile, non-pharmacological pain management is considered safer to apply because it has a smaller risk, does not cause side effects, and uses physiological processes [4].

Non-pharmacological perineal wound care can be done in several ways, including the use of ice packs, cold compresses, and cushions for seating [4]. Apart from these methods, another non-pharmacological treatment that can be taken is the administration of processed Kersen leaves. Several prior studies have found that Kersen leaves can be used as medicine since they contain flavonoids, saponins, polyphenols, and tannins which act as antioxidants as well as anti-bacterial and anti-inflammatory agents [6]. In addition, several previous studies have also used Kersen leaves in the treatment of perineal wounds.

The results of a prior study conducted by Retno Setyo Iswati and Yefi Marliandi (2017)

entitled “The Effect of Kersen (*Muntingia calabura L.*) Leaf Extract on Perineal Wound Healing” showed that 9 people in the treatment group given Kersen leaf extract (45%) experienced a rapid healing process, whereas 1 person (5%) had a slow healing process. Meanwhile, 3 people in the control group (15%) had a rapid healing process and 7 others (35%) had a slow healing process. The results of the analysis using the Chi Square test in this study obtained  $p$  value = 0.02 ( $p < 0.05$ ). Therefore, this study proves that there is an effect of the administration of Kersen leaf extract on perineal wound healing [6].

One of the processed Kersen leaf products is MSH Herbal’s dried Kersen leaves. Products from MSH Herbal have been tested and have a PIRT (Home Industry Food Products) license. The dried Kersen leaves produced by MSH Herbal are processed by drying using a dehydrator for 10 hours. This produces high-quality dried Kersen leaves, which are then hygienically packaged. Dried Kersen leaves can be brewed and served as tea.

This present study is in accordance with the objectives of women-centered services, namely aspects of focusing on women’s individuality, unique needs, hopes, and aspirations, rather than on the needs of the institutions or related professions involved; aspects of monitoring them thoroughly through all stages of pregnancy, childbirth, and postpartum period; and aspects of giving holistic care in terms of addressing women’s social, emotional, physical, psychological, spiritual, and cultural needs and expectations.

Based on this background, the researchers conducted a study entitled “The Effect of Processed Kersen (*Muntingia calabura L.*) Leaf Products on Perineal Wound Healing in Postpartum Women in the Work Area of the Ciledug Public Health Center, Cirebon in 2021”.

The purpose of this study is to determine the effect of processed Kersen leaf products on perineal wound healing in postpartum mothers.

### Methods

This quantitative study applied a quasi-experimental method with the posttest only control group design. With this design, the effect of

intervention on the treatment group was measured by comparing it with the control group.

This study was conducted in the work area of the Ciledug Public Health Center in April 2021. The samples consisted of 19 postpartum mothers who were asked to drink processed Kersen leaf products as the treatment group and 19 postpartum mothers without any intervention as the control group. The measurement of the effect of processed Kersen leaf products on perineal wound healing used the REEDA scale, while the data analysis was carried out using the Chi Square test.

This study has obtained an approval of Ethical Clearance from the Health Research Ethics Committee of Sekolah Tinggi Ilmu Kesehatan Bakti Tunas Husada Tasikmalaya with No. 051/kepk-bth/III/2021.

## Results and Discussions

### Results

**Table 1 Duration of perineal wound healing in postpartum mothers who drank processed Kersen leaf products in the work area of the Ciledug Public Health Center, Cirebon District in 2021.**

Duration of Perineal Wound Healing	Frequency (f)	Percentage (%)
4 days	3	15.8
5 days	13	68.4
6 days	3	15.8
Total	19	100.0

Based on Table 1 above, it can be seen that for most respondents (13 people; 68.4%) who drank processed Kersen leaf products, the perineal wound recovered on Day 5.

**Table 2 Duration of perineal wound healing in postpartum mothers who did not drink processed Kersen leaf products in the work area of the Ciledug Public Health Center, Cirebon District in 2021.**

Duration of Perineal Wound	Frequency (f)	Percentage (%)
----------------------------	---------------	----------------

Healing		
6 days	6	31.6
7 days	8	42.1
8 days	5	26.3
Total	19	100.0

As presented in Table 2, the perineal wound of most respondents (8 people; 42.1%) who did not drink processed Kersen leaf products recovered on Day 7.

**Table 3 Healing process of perineal wounds in postpartum mothers who drank processed Kersen leaf products in the work area of the Ciledug Public Health Center, Cirebon District in 2021.**

Perineal Wound Healing Process	Frequency (f)	Percentage (%)
Based on Time		
Rapid	19	100.0
Normal	0	0.0
Slow	0	0.0
Total	19	100.0

Table 3 shows that all respondents who drank processed Kersen leaf products (19 people; 100%) had a rapid perineal wound healing time.

**Table 4 Healing process of perineal wounds in postpartum mothers who did not drink processed Kersen leaf products in the work area of the Ciledug Public Health Center, Cirebon District in 2021.**

Perineal Wound Healing Process	Frequency (f)	Percentage (%)
Based on Time		
Rapid	6	31.6
Normal	13	68.4
Slow	0	0.0
Total	19	100.0

It can be seen in Table 4 above that among the respondents who did not drink processed leaf products, 6 of them (31.6%) had a rapid healing time and 13 of them (68.4%) had a normal healing time.

Table 5 Chi-square test results

	Processed Kersen Leaf Products		<i>p-value</i>
	<i>Given</i>	<i>Not Given</i>	
Rapid	19	6	0.000
Normal	0	13	
Total	19	19	

Based on Table 5, the obtained  $p$ -value from the Chi-square test was 0.000 ( $\alpha = <0.05$ ).

## Discussions

### 1. The Effect of Processed Kersen Leaf Products

The results of the Chi-Square test obtained a  $p$ -value of 0.000 ( $p < 0.05$ ), meaning that there is a significant effect of processed Kersen leaf products taken by postpartum mothers in the work area of the Ciledug Public Health Center in 2021 on their perineal wound healing.

### 2. Duration of Perineal Wound Healing

The durations of perineal wound healing in postpartum mothers in the work area of the Ciledug Public Health Center, Cirebon who drank processed Kersen leaf products were as follows: 4 days for 3 people (15.8%), 5 days for 13 people (68.4%), and 6 days for 3 people (15.8%). Meanwhile, the durations of perineal wound healing in postpartum mothers in the work area of the Ciledug Public Health Center, Cirebon who did not drink processed Kersen leaf products as shown in Table 4 were: 6 days for 6 people (31.6%), 7 days for 8 people (42.1%), and 8 days for 5 people (26.3%). Perineal wound starts to heal with the formation of new tissues covering the perineal wound within 6-7 days. The wound is considered healed if it is not red, it begins to dry and close, and there are no signs of infection (redness, swelling, hot to the touch, increased pain, etc.) [32].

Wound healing process consists of three phases. The first is the inflammatory phase (first 24 hours-48 hours). Following the skin trauma, severed blood vessels will cause

bleeding and the body will try to stop it, resulting in contraction of the ends of the severed blood vessels (retraction), as well as hemostatic and inflammatory reactions. The next phase is the proliferative phase (48 hours-5 days). This is characterized by the production of collagen synthesis, which begins within 24 hours of injury, reaches its peak on Day 5 to Day 7, and then decreases slowly. The final wound healing phase is the maturation phase (5 days-months). In this phase, there is a process of maturation consisting of re-absorption of excess tissue, shrinkage according to the force of gravity, and re-formation of the newly formed tissue. This phase is considered over when all signs of inflammation have disappeared, which can last for months [33].

### 3. Perineal Wound Healing Process

Based on the results of a univariate analysis of the length of the perineal wound healing process, it was found that 19 respondents who drank processed Kersen leaf products experienced a rapid perineal wound healing. This is due to respondents' compliance in drinking processed Kersen leaf products every day. Meanwhile, 6 respondents who did not drink processed Kersen leaf products experienced a rapid perineal wound healing process, whereas 13 other respondents in the control group had a normal wound healing process.

In the process, perineal wound healing is influenced by several factors, namely external factors and internal factors. External factors consist of environment, tradition, knowledge, socio-economic status, handling by health workers, maternal health conditions, and nutritional status. Meanwhile, the internal factors include mothers' age, management of tissue, hemorrhage, and hypovolemia, local edema, nutritional deficits, personal hygiene, oxygen deficit, and overactivity [25]. In addition to the factors that affect the perineal wound healing process, one of the efforts in accelerating perineal wound healing is the treatment of perineal wounds by pharmacological or non-pharmacological methods [4].

One of the non-pharmacological handling methods is the administration of processed Kersen leaf products. In her study, Khasanah (2014) found that flavonoid compounds in Kersen (*Muntingia calabura L.*) leaf extract can help accelerate wound healing. These compounds will be processed and then metabolized into leukotrienes which have a role as a trigger for neutrophils to enter the tissue. After that, the diameter of the neutrophils will increase fivefold to become macrophages, which will eventually destroy the bacteria and have an effect in reducing erythema during the inflammatory phase [29]. In addition, Kersen leaves also have antimicrobial activity that can kill *Staphylococcus aureus* bacteria [30]. Another content of Kersen leaves, namely saponins, has the ability as a cleanser and antiseptic which functions to kill germs or prevent the growth of microorganisms in wounds so that there is no serious wound infection [31].

The way to serve processed Kersen leaf product is by brewing 2 teaspoons of dried Kersen leaves in 200 ml of boiling water, then straining it after changing color. The brewed Kersen leaf tea is to be drunk once a day or 4 times a week.

#### 4. Analysis of the Effect of Processed Kersen Leaf Products

The results of the analysis using the Chi Square test showed the obtained p-value = 0.000 ( $p < 0.05$ ), meaning that there was a significant effect of processed Kersen leaf products taken by postpartum mothers on their perineal wound healing

The results of this present study are in line with a previous study carried out by Retno Setyo Iswati and Yefi Marliandiani (2017) on perineal wound healing using Kersen leaf extract with a total of 20 respondents. In the group treated with Kersen leaf extract, 9 people (45%) experienced a rapid healing process, whereas 1 person (5%) had a slow healing process. Meanwhile, in the control group, 3 people (15%) experienced a rapid healing process and 7 people (35%) had a slow healing process. The results of the analysis using the

Chi Square test obtained p value = 0.02 ( $p < 0.05$ ), which means that there was a significant difference between those given the Kersen leaf extract and those who were not [6].

This study also aligns with a scientific paper by Keimajiandra H. A. M. (2019) entitled "The Use of Decoction of Kersen Leaves to Accelerate Perineal Wound Healing in Postpartum Mothers". The results showed that all respondents experienced dryness after using decoction of Kersen leaves and their wound healed on Day 5. This proves that decoction of Kersen leaves can accelerate the healing of perineal wounds in postpartum mothers [7].

It can be concluded from the results of this present study and several previous studies that Kersen leaves can accelerate the healing process of perineal wounds in postpartum mothers; there is a significant difference between those who drink processed Kersen leaf products and those who do not. In handling perineal wound healing in postpartum mothers, health workers also play a vital role in suggesting ways of proper perineal wound care and treatment so as to accelerate the healing process in postpartum mothers. If postpartum mothers treat their perineal wounds properly according to the direction of the health workers, the perineal wounds can heal faster and there will be no cases of perineal wound infection in postpartum mothers.

#### Conclusions

Based on the results of the study, it can be concluded that:

1. Processed Kersen leaf products have an effect on perineal wound healing in postpartum mothers.
2. The process of perineal wound healing using processed Kersen leaf products is found to be faster than those without processed Kersen leaf products.
3. The results of the analysis using the Chi Square test showed the obtained p-value = 0.000 ( $p < 0.05$ ), meaning that there was a significant effect of processed Kersen leaf products taken

by postpartum mothers on their perineal wound healing.

### Acknowledgements

The authors would like to profusely thank all parties for the assistance in the completion of this study and the preparation of the report.

### References

- [1] Wahyuningsih, Heni Puji. *Asuhan Kebidanan Nifas dan Menyusui* [Postpartum and Breastfeeding Midwifery Care]. Ministry of Health of the Republic of Indonesia. 2018. pp. 4-6, 18-19, 206-208.
- [2] West Java Provincial Health Office. *Profil Kesehatan Jawa Barat Tahun 2019* [The 2019 Health Profile of West Java]. 2019.
- [3] Campion. *Angka Robekan Perineum* [Perineal Tear Rate]. Jakarta: EGC, 2009.
- [4] Susilawati, Elly, and Wita Raniva I. *Efektifitas Kompres Hangat dan Kompres Dingin terhadap Intensitas Nyeri Luka Perineum pada Ibu Post Partum di BPM Siti Julaeha Pekanbaru* [The Effectiveness of Warm Compresses and Cold Compresses on the Intensity of Perineal Wound Pain in Postpartum Mothers at BPM Siti Julaeha Pekanbaru]. 2019. 3 (1): 8. Retrieved 30 September 2020 from JOMIS. <http://jurnal.univrab.ac.id/index.php/jomis/article/view/638>.
- [5] Cirebon District Health Office. *Profil Kesehatan Kabupaten Cirebon Tahun 2020* [The 2020 Health Profile of Cirebon District]. 2020.
- [6] Iswati, Retno, and Yefi Marliandiani. *Pengaruh Ekstrak Daun Kersen (*Muntingia calabura L.*) terhadap Penyembuhan Luka Perineum* [The Effects of Kersen (*Muntingia calabura L.*) Leaf Extract on Perineal Wound Healing]. 2017. 9 (1): 6-8. Retrieved 25 September 2020 from EMBRIO Jurnal Kebidanan. <http://jurnal.unipasby.ac.id/index.php/embrio/article/view/695>.
- [7] Marwah, Keimajiandra H. A.. *Penggunaan Rebusan Daun Kersen untuk Percepatan Penyembuhan Luka Perineum pada Ibu Nifas* [The Use of Decoction of Kersen Leaves to Accelerate Perineal Wound Healing in Postpartum Mothers]. REPOSITORY [Online document]. 2019. Retrieved 25 September 2020 from <http://eprints.aiska-university.ac.id/id/eprint/573>.
- [8] Saleha, Sitti. *Asuhan Kebidanan pada Masa Nifas* [Midwifery Care during Postpartum Period]. Jakarta: Salemba Medika, 2009.
- [9] Varney, Helen, Jan M. Kriebs, and Carolyn L. Geger. *Buku Ajar Asuhan Kebidanan* [Textbook of Midwifery Care]. 4<sup>th</sup> ed. Vol. 2. Jakarta: EGC, 2008. pp. 958.
- [10] Sulistianingsih, Apri, and Yossy Wijayanti. *Faktor yang Berpengaruh terhadap Penyembuhan Luka Perineum pada Ibu Postpartum* [Factors that Affect Perineal Wound Healing in Postpartum Mothers]. 2019. 2 (1). Retrieved 28 November 2020 from Journal for Quality in Women's Health. <http://jurnal.strada.ac.id/jqwh>.
- [11] Davidson, Nancy. REEDA: Evaluating Postpartum Healing. *J Nurse Midwifery*, 1974.
- [12] Zuhana, Nina, Lia Dwi Prafitri, and Wahyu Ersila. The Giving of Guava Leaves Boiled Water to Postpartum Perineal Wound Healing. *J Kesehat Masy*. 2018; 14(1):115–25.
- [13] Lim, T.K. *Edible Medical and Non-Medical Plant*. London New York: Springer Dordrecht Heidelberg, 2012.
- [14] Sari, C. I. P. *Kualitas Minuman Serbuk Kersen (*Muntingia calabura L.*) dengan Variasi Konsentrasi Maltodekstrin dan Ekstrak Kayu Secang (*Caesalpinia sappan L.*)* [The Quality of Kersen (*Muntingia calabura L.*) Powder Drink with Various Concentrations of Maltodextrin and Sappan Wood (*Caesalpinia sappan L.*) Extract]. Undergraduate Thesis, Faculty of Technobiology, Universitas Atma Jaya, Yogyakarta; 2012.
- [15] Kosasih, E., Supriatna, N., and Ana, E. *Informasi Singkat Benih Kersen/Talok (*Muntingia calabura L.*)* [Brief Information of Kersen/Talok (*Muntingia calabura L.*) Seed].

- Java and Madura Forest Plant Germination Center, 2013.
- [16] Bangun, A. P., and Sarwono, B. *Khasiat dan Manfaat Mengkudu (Cetakan 1)* [Efficacy and Benefits of Noni (1<sup>st</sup> Ed.)]. Jakarta: PT Argomedia Pustaka Publisher, 2002.
- [17] Utomo, Agung Priyo, et al. *Regresi Robust untuk Memodelkan Pendapatan Usaha Industri Makanan Non-Makloon Berskala Mikro dan Kecil* [Robust Regression to Model Micro and Small Scale Non-Tolling Food Industry Revenues]. Vol. 15 No. 2. West Java: Jurnal Sekolah Tinggi Ilmu Statistik, 2013.
- [18] Noorhamdani, Yosef, and Rosalia. *Uji Ekstrak Daun Kersen (Muntingia calabura L.) sebagai Antibakteri terhadap Methicillin Resistant Staphylococcus aureus (MRSA) Secara In Vitro* [Test of Kersen (*Muntingia calabura L.*) Leaf Extract as Antibacterial against Methicillin Resistant *Staphylococcus aureus* (MRSA) In Vitro]. Malang: Universitas Brawijaya, 2011.
- [19] Ilkafah. *Daun Kersen sebagai Alternatif Terapi pada Penderita Gout Arthritis* [Kersen Leaves as an Alternative Therapy for Gout Arthritis Patients]. Vol. 1 No. 1. Makassar: Pharmacy Medical Journal, 2018.
- [20] Nazir, Moh. *Metode Penelitian* [Research Methods]. Bogor: Ghalia Indonesia, 2013.
- [21] Notoatmodjo. *Metodologi Penelitian* [Research Methodology]. Jakarta: PT Rineka Cipta, 2012.
- [22] Sugiyono. *Metodologi Penelitian Kuantitatif dan Kualitatif* [Quantitative and Qualitative Research Methodologies]. Bandung: Alfabeta, 2013.
- [23] Dahlan. *Besar Sampel dan Cara Pengambilan Sampel dalam Penelitian Kedokteran dan Kesehatan* [Sample Size and Method of Sampling in Medical and Health Research]. Jakarta: Salemba Medika, 2009.
- [24] Hidayat. *Metode Penelitian Keperawatan dan Analisis Data* [Nursing Research Methods and Data Analysis]. Jakarta: EGC, 2014.
- [25] Smeltzer, Suzzane C. *Buku Ajar Keperawatan Medikal Bedah* [Medical-Surgical Nursing Textbook]. Jakarta: EGC, 2002.
- [26] Smeltzer, Suzzane C. *Buku Ajar Keperawatan Medikal Bedah Brunner dan Suddarth* [Handbook for Brunner and Suddarth's Textbook of Medical-Surgical Nursing]. Jakarta: EGC, 2001.
- [27] Sampe, et al. *Faktor-faktor yang Berhubungan dengan Penyembuhan Luka Episiotomi* [Factors Associated with Episiotomy Wound Healing]. Makasar: Jurnal STIKES Nani Hasanudi Makasar, 2014.
- [28] Suriadi. *Perawatan Luka (Edisi 1)* [Wound Care (1<sup>st</sup> Ed.)]. Jakarta: CV. Sagung Seto, 2004.
- [29] Khasanah, I., Sarwiyono, and Puguh Surjowardojo. *Ekstrak Etanol Daun Kersen (Muntingia calabura) sebagai Antibakteri terhadap Streptococcus agalactiae Penyebab Mastitis Subklinis pada Sapi Perah* [Ethanol Extract of Kersen (*Muntingia calabura*) Leaf as Antibacterial against *Streptococcus agalactiae* that Causes Subclinical Mastitis in Dairy Cattle]. Malang: Universitas Brawijaya Malang, 2014.
- [30] Salisia, S., Khusnan, and Sugiono. *Distribusi Gen Enterotoksin Staphylococcus aureus dari Susu Segar dan Pangan Asal Hewan* [Distribution of *Staphylococcus aureus* Enterotoxin Genes from Fresh Milk and Food of Animal Origin]. Faculty of Veterinary Medicine, Universitas Gadjah Mada. Yogyakarta. 2009. Vol. 10 No. 3.
- [31] Prawira, M. Y., Sarwiyono, and Puguh Surjowardojo. *Daya Hambat Dekok Daun Kersen (Muntingia calabura L.) Terhadap Pertumbuhan Bakteri Staphylococcus aureus Penyebab Penyakit Mastitis pada Sapi Perah* [Inhibitory Power of Kersen (*Muntingia calabura L.*) Leaf Decoction against the Growth of *Staphylococcus aureus* Bacteria that Causes Mastitis in Dairy Cattle]. Animal Production Study Program, Faculty of Animal Science, Universitas Brawijaya Malang, 2013.
- [32] Hamilton, P. M. *Dasar-Dasar Keperawatan Maternitas* [Maternity Nursing Basics]. Jakarta: EGC, 2016.
- [33] Sjamsuhidajat, R, and Wim de Jong. *Buku Ajar Ilmu Bedah* [Textbook of Surgery]. Jakarta: EGC, 2004.