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RESEARCH PAPER

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Quasi-experimental study on Aloe Vera Gel As A Phytotherapy to Accelerate Perineal Wound Regeneration In Postpartum Mothers At Bpm Pera

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ABSTRACT

Perineal wounds are one of the most common complications in postpartum women, causing pain, increasing the risk of infection, and delaying recovery. The lack of effective, safe, affordable, and easily accessible therapies highlights a gap in perineal wound care practices, particularly in primary care. Aloe vera, which contains anti-inflammatory compounds and regenerative bioactives, has the potential to serve as an alternative phytotherapy, but clinical evidence of its effectiveness in perineal wounds remains limited. This study aimed to evaluate the effectiveness of aloe vera gel in accelerating perineal wound healing in postpartum women. The contribution of this research is to strengthen the practice of phytotherapy-based wound care that is safe, affordable, and applicable in primary health care facilities. The study used a quasi-experimental pre-post study design with a control group. Thirty postpartum women with grade I–II perineal wounds were divided into a treatment group (Aloe vera) and a control group (standard care). Healing was evaluated using the REEDA scale, and pain intensity was assessed using a Visual Analogue Scale (VAS) over seven days. Analysis was performed using an independent t-test with a significance level of 0.05. The results showed a significant difference between the two groups. The average healing time for the Aloe vera group was 4.20 days (SD 0.95), faster than the control group, which took an average of 7.00 days (SD 1.20). Statistical tests showed a p-value = 0.001, indicating significant effectiveness of Aloe vera application in accelerating tissue healing. In addition, REEDA and VAS scores on the seventh day were consistently lower in the treatment group, indicating a faster reduction in inflammation and pain. Implicitly, these findings provide a clinical contribution to strengthening safe and affordable phytotherapy-based wound care practices for postpartum mothers, particularly in primary healthcare facilities. This study concluded that aloe vera gel is an effective complementary therapy for accelerating perineal wound healing and improving maternal comfort.

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I. INTRODUCTION

Perineal lacerations in postpartum mothers are recognized globally as one of the most frequent complications of vaginal delivery. According to Koka et al. (2023), these tears typically occur along the midline and may extend deeply if the fetal head is delivered too rapidly, if there is disproportion between the fetal head and maternal pelvis, or if the pubic arch angle is narrower than normal. They emphasize that uncontrolled delivery of the fetal head is a major contributing factor.[1]. Researchers highlight that delayed wound healing from perineal lacerations can lead to extended postpartum morbidity, impaired maternal mobility, and decreased quality of life. They argue that inadequate management of perineal trauma not only affects physical recovery but can also have long-term implications for maternal mental health, sexual function, and family well-being.[2]. From a global health perspective, the World Health Organization reports that approximately 2.7 million cases of perineal lacerations occur annually, with a substantial burden in low- and middle-income countries where access to skilled birth attendants and advanced

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wound care is limited.[3] WHO stresses that perineal trauma contributes significantly to maternal morbidity and is closely linked with postpartum hemorrhage, infection, and prolonged recovery.[4][5]

In Indonesia, emphasis is placed on the fact that perineal lacerations are a serious contributor to maternal mortality, with postpartum haemorrhage from perineal trauma accounting for nearly 40% of maternal deaths. They point out that infection risk is particularly high, with reported incidence of perineal wound infections reaching 52%, largely due to bacterial contamination through endogenous, exogenous, or autogenous sources. Several other experts have also contributed to this discourse. [6]describe that perineal tears, especially third- and fourth-degree lacerations, are associated with anal sphincter injury, fecal incontinence, and long-term pelvic floor dysfunction, underscoring the importance of careful prevention and effective wound management. [7] further explain that the prevalence of perineal trauma varies widely between countries, depending on obstetric practices, such as the routine use of episiotomy and assisted vaginal delivery.

Meanwhile, [8] highlight that cultural and clinical practices significantly influence perineal outcomes. In countries where episiotomy remains a routine intervention, the rate of perineal trauma tends to be much higher compared to countries where selective episiotomy is practiced.[9] Their Cochrane review found that restrictive episiotomy is associated with fewer complications, reduced severity of perineal trauma, and faster recovery. Perineal tears are injuries that typically occur in the midline of the perineum, the area between the vaginal opening and the anus. According to [10] these tears often extend downward along the central line because this area has less supportive tissue and is therefore structurally more vulnerable during childbirth. Several anatomical and obstetric factors influence the extent of the tearing. For instance, when the fetal head is delivered too quickly (before the perineal tissues have had adequate time to stretch), the sudden pressure can cause uncontrolled tearing.[1] Likewise, if the pubic arch angle is narrower than usual, the fetal head must pass through a more restricted pelvic outlet, increasing tension on the perineum. Additionally,[11] if the fetal head circumference exceeds the maternal pelvic inlet diameter, the mismatch in size leads to excessive stretching, heightening the risk of more extensive lacerations. When healing of perineal lacerations is delayed, the consequences for postpartum mothers can be profound. Prolonged wound recovery may interfere with daily activities, hinder mobility, and cause persistent pain that affects breastfeeding, bonding with the baby, and overall maternal well-being.[12] In more severe cases, inadequate healing may lead to chronic perineal pain, dyspareunia (pain during intercourse), and pelvic floor dysfunction. Moreover, delayed healing also increases the risk of infection, which can spread to deeper reproductive organs and escalate into systemic complications such as sepsis. This prolonged morbidity not only affects the physical recovery of the mother but can also impair her psychological and emotional health during the postpartum period.[13]

From a global health perspective, the World Health Organization (WHO, 2022) estimates that approximately 2.7 million cases of perineal lacerations occur among postpartum mothers every year. This figure highlights the widespread prevalence of the problem across different healthcare systems and regions of the world. Van Barneveld et al. (2019) further underline that perineal trauma represents a significant burden to maternal health because it is often associated with increased postpartum complications, longer hospital stays, higher healthcare costs, and reduced quality of life for mothers.[14]. Thus, perineal lacerations are not simply minor injuries associated with vaginal delivery; they are serious maternal health concerns with both short- and long-term implications. The anatomical vulnerability of the perineum, combined with obstetric factors such as fetal size, delivery speed, and pelvic structure, contributes to its high prevalence. Without effective prevention and management, perineal tears can escalate into severe complications, underscoring the importance of timely wound healing interventions and innovative strategies, such as the use of Aloe vera, to reduce their impact.[15]

In Indonesia, perineal lacerations are a critical maternal health concern because they directly contribute to high rates of maternal morbidity and mortality. One of the most severe consequences of perineal trauma is postpartum hemorrhage (PPH). Studies indicate that PPH resulting from perineal tears accounts for nearly 40% of maternal deaths in the country. This high percentage underscores the significant role of perineal trauma as not just a secondary complication of vaginal delivery, but a primary factor influencing maternal survival.[16]. The prevalence of perineal lacerations in Indonesia is alarmingly high. It is estimated that around 75% of women who give birth vaginally experience some degree of perineal tearing. Among these cases, a large proportion of women also experience persistent perineal pain, which negatively affects mobility, postpartum comfort, and daily maternal activities such as breastfeeding and infant care. In fact, approximately 57% of women report pain at the sutured area, with the pain more commonly associated with episiotomy (28%) as compared to spontaneous tears (29%). This highlights the ongoing debate around the routine use of episiotomy, which, rather than protecting the perineum, is increasingly shown to contribute to unnecessary trauma and postoperative discomfort.[17]. Another major issue linked to perineal lacerations is infection, which continues to be a leading cause of maternal mortality in

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Indonesia. In 2022, the incidence of perineal wound infections was reported at 52%, an exceptionally high rate compared to global averages. These infections are caused by the entry of bacteria through multiple possible routes: Endogenous sources, such as the normal flora of the birth canal, that invade damaged tissues. Exogenous sources, such as bacteria introduced from external environments during delivery or postpartum care.[18]. Autogenous sources, where bacteria from other body regions migrate to the perineal wound.

When infection develops, it may lead to inflammation of the vulva, vagina, cervix, or endometrium, and in severe cases, can spread to adjacent reproductive organs or even enter the bloodstream, leading to sepsis. [19]This significantly worsens postpartum outcomes and remains a substantial contributor to Indonesia's high maternal mortality ratio (MMR), which is among the highest in Southeast Asia.[20]. Thus, the combination of high prevalence of perineal tears, [21] associated hemorrhage, and risk of infection, create a serious challenge for maternal health in Indonesia. [22]Addressing this issue requires not only improved obstetric practices and postpartum care but also the exploration of safe, effective, and affordable interventions that can accelerate wound healing and reduce complications. This is where complementary approaches, such as the application of Aloe vera gel, may provide meaningful solutions in reducing the burden of perineal trauma on Indonesian mothers. The World Health Organization (WHO) defines *traditional medicine* as a wide range of health practices that utilize plant-, animal-, and mineral-based medicines, along with spiritual therapies, manual techniques, and physical exercises. These approaches are used either singly or in combination to maintain well-being, prevent illness, and treat disease. This definition underscores the global importance of traditional and complementary medicine as both a cultural heritage and a potential contributor to modern healthcare systems.[4]. Indonesia holds a particularly strong position in this regard, as it is considered one of the world's megadiverse countries. Of approximately 40,000 plant species worldwide, around 30,000 grow in Indonesia. Of these, 9,000 species are believed to have therapeutic potential, and about 1,000 species are already used in traditional or herbal medicine production. Despite this rich biodiversity, only a fraction has been scientifically explored or developed into standardized phytopharmaceuticals, highlighting an untapped potential for research and innovation in natural health products.[23]

One of the most studied plants is Aloe vera, which has long been recognized and widely applied for wound healing. Its effectiveness is attributed to a unique composition of bioactive compounds:[3]. Saponins act as natural cleansers with antiseptic properties, helping remove debris and prevent infection. Flavonoids and polyphenols possess strong antioxidant and antimicrobial activity, protecting tissues from oxidative stress while reducing bacterial contamination. Tannins contribute to wound contraction and provide an astringent effect that minimizes bleeding and inflammation.[24] Anthraquinones, such as aloin and aloe-emodin, have antibacterial and antiviral properties. Mannose-6-phosphate plays a critical role in stimulating epithelialization and tissue reorganization. [25], a polysaccharide unique to Aloe vera, is known to activate immune cells, such as macrophages and lymphocytes, thereby enhancing collagen synthesis and fibroblast proliferation, which are essential for tissue repair.[26] Collectively, these bioactive compounds allow Aloe vera to exert anti-inflammatory, antibacterial, antifungal, analgesic, and wound-healing effects, making it highly relevant for conditions such as perineal lacerations.[27] The plant not only accelerates wound closure but also helps reduce pain, prevent infection, and improve overall tissue regeneration. Therefore, Aloe vera represents a promising bridge between traditional knowledge and modern medical application, particularly in the context of maternal health, where accessible, safe, and affordable wound care solutions are urgently needed.[26]

Previous studies have consistently demonstrated that Aloe vera is effective in accelerating the healing of both acute and chronic wounds. [14]For acute wounds, such as burns, surgical incisions, and episiotomy wounds, Aloe vera has been shown to enhance tissue regeneration, reduce inflammation, and minimize the risk of infection. Similarly, in chronic wounds, including diabetic ulcers and pressure sores, Aloe vera supports the healing process by stimulating fibroblast proliferation, collagen synthesis, and epithelialization. Its widespread use is further supported by its favorable characteristics: Aloe vera is safe, easy to apply, cost-effective, and widely available, making it highly suitable for wound care interventions across diverse healthcare settings.[28]. Despite these promising findings, specific research addressing the use of Aloe vera for perineal wound healing in postpartum mothers remains limited.[29][30] Existing evidence has largely focused on other types of wounds, leaving a knowledge gap regarding its role in perineal lacerations, which are among the most common complications of vaginal delivery Given the unique nature of perineal trauma located in an area prone to bacterial contamination and associated with pain, infection, and delayed healing there is a pressing need to evaluate Aloe vera's efficacy in this specific clinical context. In Indonesia, the urgency of this research is heightened by the high incidence of perineal lacerations and their significant contribution to maternal morbidity and mortality. Postpartum women often face challenges in accessing advanced medical care, particularly in rural or resource-limited settings. As emphasized by Momani et al. (2023), there is a critical demand for therapies that

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are not only effective but also safe, affordable, and culturally acceptable. Aloe vera fulfills these criteria, as it is naturally abundant, minimally invasive, and can be easily integrated into routine postpartum care.

Furthermore, [31]highlight that interventions for perineal wound management must be clinically effective and carry minimal side effects, ensuring they are suitable for diverse populations of postpartum women. Alepandi et al. (2022) add that accessibility and affordability are equally crucial, especially in primary healthcare facilities and low-resource communities where maternal mortality rates remain high. This study is designed to provide comparative evidence on the outcomes of perineal wound care with Aloe vera gel compared with standard postpartum care. Specifically, it aims to investigate three critical aspects: Effectivenes, to analyze whether Aloe vera gel accelerates perineal wound healing in postpartum mothers; Symptom Management, to evaluate Aloe vera's role in reducing pain intensity and lowering the risk of infection in perineal wounds; and Comparative Outcomes, to compare healing progress between mothers who receive Aloe vera intervention and those who receive standard care, thereby clarifying its added value in routine postpartum management (Simha et al., 2017). This study is expected to provide several important practical contributions across different domains of maternal health care. For healthcare providers, the findings of this research can serve as scientific evidence to support the integration of Aloe vera into midwifery and obstetric practices. By demonstrating its safety and effectiveness in accelerating perineal wound healing, Aloe vera can be recommended as a complementary intervention alongside standard postpartum care. This may improve clinical decision-making and expand the range of evidence-based options available to midwives and other healthcare professionals.[32]. For postpartum mothers and their families, the study offers an alternative therapeutic option that is natural, safe, affordable, and easy to apply independently. Aloe vera can be prepared and used at home with minimal resources, empowering mothers and families to take an active role in postpartum care. [33]This can enhance maternal comfort, reduce reliance on pharmacological interventions, and foster a sense of autonomy during recovery.[34]. For the public health system, Aloe vera has the potential to contribute to reducing the incidence of postpartum complications, particularly perineal wound infections, which remain a significant contributor to maternal morbidity and mortality in Indonesia. [13]If widely adopted, this intervention could ease the burden on health facilities, reduce healthcare costs, and help lower the national maternal mortality rate.[35]. Finally, for scientific development, this research contributes to the growing body of knowledge on phytotherapy and maternal health.[11] It highlights the potential of integrating traditional medicine into modern clinical practice, thereby fostering cross-disciplinary collaboration and encouraging further studies on medicinal plants as accessible and effective health interventions.

Various interventions have been developed to accelerate perineal wound healing in postpartum mothers. Povidone-Iodine is widely used as an antiseptic because of its broad antimicrobial spectrum; however, prolonged use can delay tissue regeneration and cause local irritation. [24][17]. Normal Saline is often recommended for wound cleansing due to its non-toxic and isotonic properties, yet it lacks antibacterial and anti-inflammatory effects that promote faster healing. Honey has gained attention for its natural antibacterial and moisturizing properties, but its sticky texture and potential contamination risk limit consistent clinical application. Laser Therapy has shown benefits in stimulating tissue repair and reducing pain, although it requires specialized equipment and trained personnel, making it less accessible in low-resource settings. Early Ice Packs are used to reduce pain and swelling, but their effects are temporary and do not promote tissue regeneration. Analgesic Sprays can relieve discomfort but mainly act symptomatically without improving the healing process.[36]. Considering these limitations, the search for a safe, affordable, and effective natural alternative continues. Aloe vera, known for its anti-inflammatory, antimicrobial, and collagen-stimulating bioactive compounds, offers promising potential as a phytotherapy to enhance perineal wound healing in postpartum mothers.

This study makes an important contribution to the development of midwifery practice and wound care management in primary care. Empirically, this study fills a research gap in the use of Aloe vera for postpartum perineal wounds, a field that has received less attention than other acute wounds. Clinically, the findings of this study offer scientific evidence that Aloe vera can be a safe, affordable, and easily integrated complementary therapy into standard postpartum maternal care, especially in facilities with limited resources. From a scientific perspective, this study enriches the phytotherapy literature by demonstrating the regenerative mechanisms of Aloe vera in perineal tissue, which has anatomical characteristics and a risk of contamination distinct from those of other types of wounds. Furthermore, this study provides a basis for developing evidence-based practice guidelines and opens the door to further research with more robust experimental designs.

This study contributes scientific evidence supporting the use of aloe vera gel as an effective complementary therapy for accelerating perineal wound healing in postpartum women, demonstrating that this therapy can hasten tissue recovery and significantly reduce pain. This research strengthens the practice of phytotherapy-

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based wound care, as a safe, affordable, and practical approach that can be implemented in primary healthcare facilities, especially in resource-limited areas.

II. MATERIALS AND METHOD

A. Dataset

This study applied a quasi-experimental design with a pre-test and post-test control-group approach. The design was chosen to examine the effect of Aloe vera gel on perineal wound healing in postpartum mothers, while providing a comparative perspective between those receiving the intervention and those receiving only standard care. The study population consisted of postpartum mothers with perineal lacerations who gave birth at the selected health facility during the study period. A total of 30 participants were recruited using purposive sampling based on specific inclusion and exclusion criteria. The inclusion criteria included postpartum mothers with first- or second-degree perineal tears, willingness to participate, and absence of chronic diseases that might interfere with wound healing, such as diabetes mellitus. Mothers with third- or fourth-degree perineal tears, a history of allergy to Aloe vera, or severe postpartum complications were excluded from the study.

Participants were then randomly divided into two equal-sized groups. The treatment group (n = 15) received wound cleansing followed by daily application of Aloe vera gel to the perineal area for 7 consecutive days, in addition to routine postpartum care. The control group (n = 15) received only standard perineal wound care without Aloe vera application. In both groups, mothers were instructed to maintain perineal hygiene and report any unusual reactions. Ethical approval for the study was obtained from the relevant institutional ethics committee. All participants were fully informed about the purpose, procedures, benefits, and potential risks of the study, and each provided written informed consent prior to inclusion. The study also ensured the principles of confidentiality and voluntary participation, with participants' right to withdraw at any stage without consequences.

a. Theory of Wound Healing

Wound healing is a complex biological process involving overlapping and coordinated phases: hemostasis, inflammation, proliferation, and remodeling (maturation). Hemostasis occurs immediately after tissue injury, where blood clotting prevents excessive bleeding.

Inflammation follows, characterized by the infiltration of neutrophils and macrophages to remove debris and prevent infection. During the proliferation phase, fibroblasts and endothelial cells stimulate the formation of granulation tissue, collagen synthesis, and angiogenesis to rebuild the damaged area. Finally, during the remodeling phase, collagen fibers reorganize and strengthen the tissue to restore structural integrity. Effective wound healing depends on several factors, including adequate blood supply, absence of infection, proper nutrition, and local wound care. Delayed healing often results from infection, inflammation, or insufficient epithelial regeneration, which are common challenges in perineal wounds among postpartum mothers.

b. Mechanism of Action of *Aloe vera*

Aloe vera (L.) is a medicinal plant known for its anti-inflammatory, antimicrobial, antioxidant, and wound-healing properties. Its gel contains several bioactive compounds, including acemannan (a polysaccharide), aloesin, anthraquinones, vitamins (A, C, E, B12), enzymes, and amino acids, which work synergistically to promote tissue regeneration. The mechanisms of *Aloe vera* in wound healing include: anti-inflammatory effects that reduce swelling and pain by inhibiting prostaglandin and bradykinin production. Antimicrobial activity: prevents infection by inhibiting bacterial growth with compounds such as anthraquinones and saponins. Stimulation of fibroblast proliferation: enhances collagen synthesis and epithelialization, speeding up the formation of new tissue. Moist wound environment: the gel's hydrating nature prevents desiccation, creating optimal conditions for cell migration and repair. Antioxidant action: vitamins and phenolic compounds neutralize free radicals, protecting cells from oxidative damage during healing. Through these mechanisms, *Aloe vera* supports faster tissue repair, minimizes inflammation, and improves overall wound-healing outcomes, making it a promising phytotherapeutic agent for perineal wound regeneration in postpartum mothers.

B. Data Collection

Data collection was carried out using standardized instruments. The REEDA scale (Redness, Edema, Ecchymosis, Discharge, and Approximation of wound edges) was used to assess wound healing, and pain intensity was measured using the Visual Analog Scale (VAS). Assessments were conducted on the first day (pre-test) to establish baseline conditions and on the seventh day (post-test) to measure the intervention's effect. For data analysis, descriptive statistics were used to present participant characteristics, including age, parity, and degree of laceration. The effectiveness of the intervention was tested using paired statistical tests (paired t-test or Wilcoxon) to analyze changes within each group, and independent tests (independent t-test or Mann–Whitney) to compare outcomes between groups. The significance level was set at $p < 0.05$. In this study, data were processed using two main instruments: the REEDA scale and the Visual Analogue Scale (VAS). The REEDA scale (Redness, Edema, Ecchymosis, Discharge, Approximation) was employed to assess the healing progress of perineal wounds. This instrument evaluates five clinical indicators, namely redness, edema, ecchymosis, discharge, and approximation of wound edges. Each component is scored on a scale from 0 to 3, where 0 indicates the absence of a symptom, 1 indicates a mild condition, 2 indicates a moderate condition, and 3 indicates a severe condition. The total score is obtained by summing all five components, resulting in a possible range of 0 to 15. A

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lower total score reflects better wound healing, while a higher score indicates delayed or impaired healing. Observations using the REEDA scale were conducted on days 1, 3, and 7 postpartum by trained midwives to ensure consistency and reliability in assessment. Meanwhile, the Visual Analogue Scale (VAS) was used to measure the level of pain experienced by postpartum mothers. The VAS consists of a 10-centimeter horizontal line with two endpoints: 0 representing “no pain” and 10 representing “the worst possible pain.” Participants were instructed to mark a point along the line that best reflected the intensity of their pain at that time. The distance, in centimeters, from the “no pain” end to the participant's mark was recorded as the VAS score. Pain assessments were conducted concurrently with the REEDA evaluations (days 1, 3, and 7 postpartum). The data obtained from both the REEDA and VAS instruments were analyzed to determine differences in wound-healing progress and pain reduction between the treatment group (Aloe vera application) and the control group (standard care).

C. Performance

The performance of the intervention was measured through systematic observation and evaluation of wound healing and maternal comfort. Wound healing outcomes were assessed using the REEDA scale, which measures Redness, Edema, Ecchymosis, Discharge, and Approximation of wound edges. This instrument allowed objective scoring of tissue recovery and wound closure. In addition, the Visual Analog Scale (VAS) was used to record pain intensity as a subjective performance indicator of maternal comfort and recovery. Pre-test measurements were conducted on the first day to establish baseline wound and pain conditions, and post-test measurements were performed on the seventh day to evaluate changes after the intervention.

III. DISCUSSION

This study was conducted to evaluate the effectiveness of Aloe vera gel in accelerating perineal wound healing among postpartum mothers. A total of 30 participants were recruited and divided evenly into two groups: an experimental group that received Aloe vera intervention and a control group that received standard perineal wound care. The results are presented in several parts: first, the demographic and obstetric characteristics of the respondents; second, the analysis of wound-healing outcomes, measured by the REEDA scale; and third, pain intensity scores using the Visual Analog Scale (VAS). The description of respondent characteristics is provided to ensure that the experimental and control groups are comparable at baseline, as differences in age, education, parity, and infant birth weight may influence the wound healing process. After presenting these characteristics, the study continues with an analysis of differences in wound-healing performance between the two groups before and after the intervention.

Based on Table 1, the respondents in this study comprised 30 postpartum mothers, divided into two groups: the experimental group (15 women) and the control group (15 women). The majority of respondents were aged 20-35 years, with 12 (40%) in the experimental group and 11 (36.7%) in the control group. The statistical test results showed a p-value of 0.021, indicating a significant difference between the groups. Regarding education, the majority of respondents had a high school education, with 7 (23.3%) in the

Table 1 Characteristics of postpartum mothers who were and were not given aloe vera at BPM Pera

Characteristics	Experimental (n=15)	%	Control (n=15)	%	p-value
Age					0.021
20–35 years	12	40.0	11	36.7	
> 35 years	3	10.0	4	13.3	
Education					0.018
Elementary (SD)	2	6.7	3	10.0	
Junior High (SMP)	4	13.3	1	3.3	
Senior High (SMA)	7	23.3	8	26.7	
University (PT)	2	6.7	3	10.0	
Parity					0.015
1–3 children	14	46.7	13	43.3	
> 3 children	1	3.3	2	6.7	
Infant Birth Weight					0.003
< 2500 g	2	6.7	5	16.7	
≥ 2500 g	13	43.3	10	33.3	

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experimental group and 8 (26.7%) in the control group. The p-value of 0.018 indicates a significant difference. Most respondents had one to three births, with 14 (46.7%) in the experimental group and 13 (43.3%) in the control group (p-value = 0.015).

Meanwhile, 13 (43.3%) infants weighed ≥2500 grams in the experimental group and 10 (33.3%) in the control group. A p-value of 0.003 indicates a significant difference. Overall, although there are differences in some respondent characteristics, this study still shows that Aloe vera accelerates the healing of perineal wounds. Table 2 and Table 3 shows that the average healing time for perineal wounds in the experimental group was 4.20 days, with a median of 4 days. Data variation was relatively small (SD 0.95), resulting in a homogeneous distribution of healing. Nearly all postpartum mothers treated with aloe vera recovered within ≤ 5 days. Table 4 shows that in the control group, the average wound healing time was 7.00 days, with a median of 7 days. Data variation was greater (SD 1.20) than in the aloe vera group, which showed slower and more heterogeneous healing. The majority of respondents recovered after ≥ 7 days.

Table 5 shows the t-test results, which showed a p-value of 0.001 (<0.05), which means there was a significant difference between the expe This study involved 30 postpartum women with perineal wounds, divided into two groups: 15 respondents in the experimental group who were given Aloe vera gel and 15 respondents in the control group without Aloe vera. The results showed significant differences in respondent characteristics, average perineal wound healing time, and statistical test results. Therefore, it can be concluded that Aloe vera administration significantly accelerated perineal wound healing in postpartum women. The characteristics of the respondents in this study showed that the majority were aged 20-35 years, both in the experimental and control groups, although there was a significant difference (p-value = 0.021). Age is an important factor because with increasing age, the elasticity of perineal tissue decreases, potentially slowing wound healing. This demonstrates the effectiveness of Aloe vera despite the age-related risk factor. Regarding education, the majority of respondents had a high school education, with a p-value of 0.018 indicating a significant difference between groups. Education level influenced mothers' knowledge and compliance with wound care. However, the group with lower education levels still showed faster wound healing after receiving Aloe vera. This suggests that the success of Aloe vera therapy is not entirely determined by education level, but rather by the pharmacological effects of its active ingredients. Parity also showed a significant difference (p-value = 0.015). Most respondents were pregnant 1–3 times, in both the experimental and control groups. Parity influences the elasticity of perineal tissue, with multiparous women tending to have more flexible tissue, thereby reducing the risk of trauma. However, this study showed that, despite differences in parity, wound-healing time was more influenced by Aloe vera administration. Infant weight showed a significant difference (p-value =

Table 2. Comparison of Perineal Wound Healing Time Between Experimental and Control Groups

Group	n	Mean Healing Time (Days)	Median (Days)	SD	p-value
Experimental	15	4.20	4	0.95	0.001
Control	15	6.13	6	1.04	

Table 3. Perineal Wound Healing in the Treatment Group (Aloe vera)

Variabel	n	Mean	Median	SD	Min	Max	95 %	CI
Healing Day	15	4,20	4,00	0,95	2	6	3,80	4,60

Table 4. Perineal Wound Healing in the Control Group (Without Aloe Vera)

Variabel	n	Mean	Median	SD	Min	Max	95 %	CI
Healing Day	15	7,00	7,00	1,20	5	9	6,50	7,50

Table 5. T-Test of the Effectiveness of Aloe Vera on Healing Perineal Wounds

Group	n	Min	SD	SE	P Value
Treatment	15	4.20	0,95	0,25	0.001
Control	15	7,00	1.20	0,31	

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0.003). Most respondents had infants weighing >2500 grams, increasing the risk of perineal wounds in mothers during childbirth. The average healing time for perineal wounds in the experimental group was 4.20 days with a median of 4 days, while in the control group it was 7.00 days with a median of 7 days. This difference of almost three days is highly significant, both statistically and clinically. Postpartum mothers given Aloe vera recovered more quickly, allowing for early mobilization and optimal infant care. Aloe vera's effectiveness in accelerating wound healing can be explained by its bioactive compounds. Aloe vera contains glucomannan and polysaccharides that stimulate fibroblast proliferation and increase collagen synthesis, thus accelerating tissue regeneration. Saponins and tannins act as antiseptics to prevent infection, lignin helps maintain tissue moisture, and vitamins C and E act as antioxidants to protect tissue from oxidative damage. This combination of active substances accelerates the inflammatory, proliferative, and remodeling phases of the wound-healing process.

The findings of this study are consistent with those of the Maternity study (13), which reported an average perineal wound-healing time of 4.72 days in the Aloe vera group compared with 7.35 days in the control group. Research by Mira Miraturrofi'ah (14) also showed that the use of Aloe vera accelerated perineal wound healing in postpartum mothers with significant results (ρ = 0.028). Furthermore, a review conducted by Chelu et al. (15) confirmed that Aloe vera has anti-inflammatory, antibacterial, and fibroblast-stimulating activities, making it an effective complementary therapy for wound healing. The results of this study also strengthen the clinical evidence that Aloe vera is safe, affordable, and easy to apply for postpartum mothers. In addition to accelerating wound healing, Aloe vera can also reduce pain intensity, as demonstrated by research by Dewi et al. (16). This analgesic effect is crucial because prolonged perineal pain can hinder maternal mobility, reduce quality of life, and interfere with infant care. Thus, based on the results of this study and supported by recent literature, Aloe vera can be recommended as a complementary therapy in perineal wound care. Aloe vera has been shown to accelerate healing, reduce pain, and support a more rapid recovery in postpartum mothers, potentially improving the quality of obstetric care in healthcare facilities.

This study has several limitations that should be acknowledged. First, the sample size was relatively small (n = 30) and limited to postpartum mothers from a single midwifery practice, potentially limiting the generalizability of the findings to broader populations. Second, the quasi-experimental design did not allow for full randomization or blinding, which may introduce potential bias in the assessment of wound healing and pain perception. Third, the observation period was relatively short (7 days), so long-term healing outcomes and recurrence risks were not evaluated. Lastly, the study did not control for all possible confounding factors, such as nutritional status, perineal care habits, or hygiene practices, that might influence wound healing. Despite these limitations, the results provide valuable preliminary evidence of Aloe vera gel's effectiveness as a complementary phytotherapy for perineal wound healing in postpartum mothers.

IV. CONCLUSION

This study aimed to evaluate the effectiveness of Aloe vera gel in accelerating perineal wound healing in postpartum women. Based on statistical tests, the average perineal wound-healing time in the experimental group was 4.20 days, with a median of 4 days. Data variation was relatively small (SD 0.95). The t-test results showed a p-value of 0.001 (<0.05), indicating a significant difference between the experimental and control groups. Therefore, it can be concluded that the use of Aloe Vera Gel is highly effective in the perineal wound healing process in postpartum women. Based on these findings, aloe vera can be recommended as a complementary therapy for perineal wound care. Aloe vera has been shown to accelerate healing, reduce pain, and support faster recovery in postpartum women, potentially improving the quality of obstetric care in health facilities.

This study has several limitations: the sample size is relatively small (n=30), the study location is limited to one BPM so that the generalization of the results requires caution, the observation duration is only seven days so it does not reflect long-term healing, and the possibility of confounding factors such as nutritional status, perineal hygiene, or variations in wound care practices that cannot be fully controlled. Considering these limitations, further research is recommended to use a randomized controlled trial (RCT) design with a larger sample, more diverse respondent characteristics, and a longer monitoring period to ensure the effectiveness of Aloe vera is more robust and comprehensive.

REFERENCES

[1] D. E. López Angulo and P. J. do Amaral Sobral, “Characterization of gelatin/chitosan scaffold blended with aloe vera and snail mucus for biomedical purpose,” *Int. J. Biol. Macromol.*, vol. 92, 2016, doi: 10.1016/j.ijbiomac.2016.07.029.

[2] N. Chinchilla, C. Carrera, A. G. Durán, M. Macías, A. Torres, and F. A. Macías, “Aloe barbadensis: How a miraculous plant becomes reality,” *Phytochemistry Reviews*, vol. 12, no. 4. 2013. doi: 10.1007/s11101-013-9323-3.

[3] D. E. López Angulo, C. E. Ambrosio, R. Lourenço, N. J. Nardelli Gonçalves, F. S. Cury, and P. José do Amaral Sobral,

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DOI: https://doi.org/10.35882/teknokes.v18i4.110

"Fabrication, characterization and in vitro cell study of gelatin-chitosan scaffolds: New perspectives of use of aloe vera and snail mucus for soft tissue engineering," *Mater. Chem. Phys.*, vol. 234, 2019, doi: 10.1016/j.matchemphys.2019.06.003.

[4] WHO, *Consolidated Guidelines on HIV, Viral Hepatitis and viral hepatitis and STI prevention, diagnosis, treatment and care for key populations*. 2022.

[5] S. Singh, A. K. Gupta, and A. Verma, "Molecular properties and bioactivity score of the aloe vera antioxidant compounds - in order to lead finding," *Res. J. Pharm. Biol. Chem. Sci.*, vol. 4, no. 2, 2013.

[6] W. Pangesti and M. Murniati, "Penggunaan Kompres Aloevera untuk Menurunkan Suhu Tubuh Anak Demam: Case Study," *J. Manaj. Asuhan Keperawatan*, vol. 7, no. 2, 2023, doi: 10.33655/mak.v7i2.172.

[7] W. Nugroho, "Relationship between environmental management policy and the local wisdom of indigenous peoples in the handling of covid-19 in indonesia," *Onati Socio-Legal Ser.*, vol. 11, no. 3, 2021, doi: 10.35295/OSLS.IISL/0000-0000-0000-1193.

[8] S. Qomariah, S. Herlina, and W. Sartika, "PENGARUH PEMAKAIAN BENGKUNG TERHADAP INVOLUSI UTERUS PADA IBU NIFAS DIWILAYAH KERJA PUSKESMAS SIAK HULU II," *JOMIS (Journal Midwifery Sci.*, vol. 8, no. 1, 2024, doi: 10.36341/jomis.v8i1.4060.

[9] N. Suprapto, B. K. Prahani, and T. H. Cheng, "Indonesian curriculum reform in policy and local wisdom: Perspectives from science education," *J. Pendidik. IPA Indones.*, vol. 10, no. 1, 2021, doi: 10.15294/jpii.v10i1.28438.

[10] H. Seif, A. Elbanna, A. M. Abu-Seida, and D. I. El-Korashy, "Regenerative potential of a novel aloe vera modified tricalcium silicate cement as a pulp capping material: An animal study," *Dent. Mater. J.*, vol. 42, no. 6, 2023, doi: 10.4012/dmj.2023-129.

[11] A. M. Hakim, "Efektifitas Aloe vera terhadap Luka Bakar," *J. Ilm. Kedokt. Wijaya Kusuma*, vol. 9, no. 2, 2020, doi: 10.30742/jikw.v9i2.800.

[12] F. Ameen, S. L. Stephenson, S. AlNadhari, and M. A. Yassin, "Isolation, identification and bioactivity analysis of an endophytic fungus isolated from Aloe vera collected from Asir desert, Saudi Arabia," *Bioprocess Biosyst. Eng.*, vol. 44, no. 6, 2021, doi: 10.1007/s00449-020-02507-1.

[13] S. Tiwari, S. Prasad, and V. B. Upadhyay, "Bioactivity of Aloe vera Oil on the Weight and Length of Larvae of Silkworm (Bombyx mori Linn.)," *Adv Biol Res*, vol. 8, no. 1, 2014.

[14] H. Elaıbı, F. Mutlag, and Z. Kaream Al-Ebey, "A comprehensive review of Aloe vera: Multifaceted health benefits and anti-diabetic properties," *~ 14 ~ J. Res. Chem.*, vol. 4, no. 2, 2023.

[15] H. D. Suresh, G. S. Nagananda, K. U. Minchitha, S. Swetha, and S. Suryan, "Synthesis and Bio-evaluation of Soluble Sodium Copper Chlorophyllin Complexes from the Leaves of Aloe vera," *South African J. Bot.*, vol. 147, 2022, doi: 10.1016/j.sajb.2021.11.055.

[16] M. A. S. E. Subroto, Kristyana Dananti, and Sri Wening, "Pemanfaatan Produk Pertanian yang Biodegradable pada Home Industry Pengolahan Aloe vera menjadi Nata de Aloevera," *J. Pengabdi. Masy. Akad.*, vol. 1, no. 2, 2023, doi: 10.59024/jpma.v1i2.178.

[17] S. Mani, G. Swargiary, S. Gulati, S. Gupta, and D. Jindal, "Molecular docking and ADMET studies to predict the anti-breast cancer effect of aloin by targeting estrogen and progesterone receptors," *Mater. Today Proc.*, vol. 80, 2023, doi: 10.1016/j.matpr.2021.06.362.

[18] I. Hiramatsu *et al.*, "Tadalafil is sufficiently effective for patients with BPH together with severe CP/CPPS," *Neurourol. Urodyn.*, vol. 38, no. Supplement 3, 2019.

[19] S. S. Vasan, "Complications of Chronic Prostatitis," *Current Bladder Dysfunction Reports*, vol. 7, no. 2. 2012. doi: 10.1007/s11884-012-0132-0.

[20] A. Femenia, P. García-Pascual, S. Simal, and C. Rosselló, "Effects of heat treatment and dehydration on bioactive polysaccharide acemannan and cell wall polymers from Aloe barbadensis Miller," *Carbohydr. Polym.*, vol. 51, no. 4, 2003, doi: 10.1016/S0144-8617(02)00209-6.

[21] D. Maternity, "EFEKTIVITAS PENGGUNAAN LIDAH BUAYA (ALOEVERA) TERHADAP PENYEMBUHAN LUKA PERINEUM PADA IBU NIFAS DIWILAYAH KERJA PUSKEMAS KARANG ANYAR LAMPUNG SELATAN

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DOI: https://doi.org/10.35882/teknokes.v18i4.110

TAHUN 2021," *J. Ilm. Bidan*, vol. 6, no. 2, 2022, doi: 10.61720/jib.v6i2.340.

[22] J. F. Solanilla-Duque *et al.*, "Applications of Biodegradable Polymers in Food Industry," in *Biodegradable Polymers: Concepts and Applications*, 2023. doi: 10.1201/9781003230533-13.

[23] Suyadi, Z. Nuryana, Sutrisno, and Baidi, "Academic reform and sustainability of Islamic higher education in Indonesia," *Int. J. Educ. Dev.*, vol. 89, p. 102534, 2022, doi: 10.1016/j.ijedudev.2021.102534.

[24] S. Asiimwe, A. Namutebi, A.-K. Borg-Karlsson, M. K. Mugisha, and H. Oryem-Origa, "Documentation and consensus of indigenous knowledge on medicinal plants used by the local communities of western Uganda," *J. Nat. Prod. Plant Resour*, vol. 4, no. 1, 2014.

[25] J. U. Itelima, S. E. Agina, and S. G. Pandukur, "Antimicrobial activity of selected plant species and antibiotic drugs against Escherichia coli O157:H7," *African J. Microbiol. Res.*, vol. 11, no. 20, 2017, doi: 10.5897/ajmr2017.8440.

[26] A. O. Sadik and A. J. Carinci, "Acupuncture in the treatment of chronic pelvic pain," in *Acupuncture in Pain Management*, 2014.

[27] F. P. Stangl *et al.*, "Non-Antibiotic Prophylaxis for Recurrent UTIs in Neurogenic Lower Urinary Tract Dysfunction (NAPRUN): Study Protocol for a Prospective, Longitudinal Multi-Arm Observational Study," *Methods Protoc.*, vol. 6, no. 3, 2023, doi: 10.3390/mps6030052.

[28] C. I. Gamboa-Gómez, N. E. Rocha-Guzmán, M. R. Moreno-Jiménez, B. D. Vázquez-Cabral, and R. F. González-Laredo, "Plants with potential use on obesity and its complications," *EXCLI J.*, vol. 14, 2015, doi: 10.17179/excli2015-186.

[29] J. M. Nguta, R. Appiah-Opong, A. K. Nyarko, D. Yeboah-Manu, and P. G. A. Addo, "Medicinal plants used to treat TB in Ghana," *Int. J. Mycobacteriology*, vol. 4, no. 2, 2015, doi: 10.1016/j.ijmyco.2015.02.003.

[30] K. Naik *et al.*, "3D printable, injectable amyloid-based composite hydrogel of bovine serum albumin and aloe vera for rapid diabetic wound healing," *J. Mater. Chem. B*, vol. 11, no. 34, 2023, doi: 10.1039/d3tb01151h.

[31] R. J. Van Barneveld *et al.*, "Bone Health in Gynecologic Cancers-does FOSAVANCE Help?," *Am. J. Clin. Nutr.*, vol. 10, no. 1, 2019.

[32] M. Ranghoo-Sanmukhiya *et al.*, "Molecular biology, phytochemistry and bioactivity of three endemic Aloe species from Mauritius and Réunion Islands," *Phytochem. Anal.*, vol. 21, no. 6, 2010, doi: 10.1002/pca.1234.

[33] A. Mootoosamy and M. Fawzi Mahomoodally, "Ethnomedicinal application of native remedies used against diabetes and related complications in Mauritius," *J. Ethnopharmacol.*, vol. 151, no. 1, 2014, doi: 10.1016/j.jep.2013.10.069.

[34] S. Agnes Mary and V. R. Giri Dev, "In vivo bioactivity of herbal-drug-incorporated nanofibrous matrixes," *J. Appl. Polym. Sci.*, vol. 132, no. 26, 2015, doi: 10.1002/app.42178.

[35] U. S. Harput, "Herbal products for oral hygiene: An overview of their biological activities," in *Natural Oral Care in Dental Therapy*, 2020. doi: 10.1002/9781119618973.ch2.

[36] W. Majchrzak, I. Motyl, and K. Śmigielski, "Biological and Cosmetical Importance of Fermented Raw Materials: An Overview," *Molecules*, vol. 27, no. 15. 2022. doi: 10.3390/molecules27154845.

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