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**RESEARCH**

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## Effectiveness of Aloe Vera-Based Topical Therapy Products on Breastfeeding Mothers with Milk Scratches in Hamparan Perak Village

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### Abstract

In Indonesia, a study revealed that approximately 86.4% of breastfeeding mothers encounter nipple issues such as blisters, dryness, and pain. The World Health Organization (WHO) emphasizes that chafed nipples contribute to substantial pain, discomfort, and diminished milk production among nursing mothers, thereby posing a hindrance to exclusive breastfeeding initiatives. This study aims to investigate the effectiveness of an aloe vera-based topical therapy product in reducing nipple chafing in breastfeeding mothers in Hamparan Perak District. Conducted as an experimental study with a pre-test and post-test control group design, the research transpired in Hamparan Perak village. The study enlisted breastfeeding mothers experiencing sore nipples, with 20 individuals in the intervention group receiving aloe vera-based topical therapy in gel form, and 20 individuals in the control group receiving a placebo. The assessment of effectiveness centered on measuring blister occurrence and nipple pain scores both before and after the intervention, employing the Mann-Whitney test for data analysis. Bivariate analysis utilizing the Mann-Whitney U-test yielded a significant P-value of 0.001. Consequently, it can be inferred that aloe vera gel demonstrably influences nipple pain, with aloe vera gel proving to be 5,537 times more effective in pain reduction. Future research could incorporate objective measures, such as clinical assessments or laboratory analyses, to validate the reported outcomes.

**Keywords:** Sore Nipples, Aloe Vera, Topical Gel.

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## 1. INTRODUCTION

Sore nipples represent a common challenge faced by breastfeeding mothers, characterized by dryness, cracks, and pain during nursing sessions, potentially hindering the milk-giving process (Rao, et al., 2017; Lestari, et al., 2021; Maleki, & Youseflu, 2022). A study conducted in Indonesia underscored the prevalence of nipple issues, revealing that approximately 86.4% of breastfeeding mothers grapple with problems such as blisters, dryness, and pain (Santos, et al., 2016; Niazi, et al., 2018). The World Health Organization (WHO) recognizes the impact of chafed nipples, citing substantial pain, discomfort, and reduced milk production as potential consequences (World Health Organization, 2018).

Various factors contribute to sore nipples in nursing mothers, including incorrect breastfeeding techniques such as improper positioning, frequency issues, and flawed insertion or removal techniques, leading to soreness, swelling, and blisters (Amir & Donath, 2007; Frizziero, et al., 2016; Centers for Disease Control and Prevention., 2020). If left untreated, sore nipples can give rise to serious health problems, such as breast infection, increasing the risk of mastitis—a condition that may interfere with milk production (Amir & Academy of Breastfeeding Medicine Protocol Committee, 2014; Niazi, et al., 2021). Difficulties in proper breastfeeding, coupled with pain and discomfort, further exacerbate the impact on milk production (Amir & Donath, 2007; Dennis, et al., 2012; Christensen, et al., 2020).

Addressing chafed nipples involves various strategies, with topical therapy products being one viable option (Nayeri, Kheirkhah, & Janani, 2019). Aloe vera, known for its constituents like aloin, mannan, and polysaccharides, possesses anti-inflammatory, antioxidant, and antibacterial properties (Surjushe, Vasani, & Saple, 2008). These components are believed to mitigate nipple inflammation and expedite the healing of chafed nipple sores (Yustiza, et al., 2023; Itrat, & Zarnigar, 2013)

This study aims to investigate the effectiveness of an aloe vera-based topical therapy product in reducing nipple chafing in breastfeeding mothers in Hamparan Perak District.

## 2. RESEARCH METHOD

The research employed an experimental design with a pre-test and post-test control group to investigate the effectiveness of aloe vera-based topical therapy products in addressing sore nipples among breastfeeding mothers. The study included a sample of breastfeeding mothers with sore nipples, divided into two groups: an intervention group comprising 20 individuals receiving aloe vera-based topical therapy in gel form (Dewi, Hani, & Anwar, 2020), and a control group comprising 20 individuals receiving a placebo. The assessment of effectiveness involved measuring blister occurrence and nipple pain scores before and after the intervention (Tateoka, 2022). Data analysis was carried out using the Mann-Whitney test.

The pre-test and post-test control group design is a suitable method for evaluating the efficacy of aloe vera-based topical therapy products in addressing sore nipples among nursing mothers. The intervention group received the actual therapeutic product based on aloe vera in gel form, while the control group received a placebo with no therapeutic effect.

Before initiating treatment, both groups underwent a pre-test to assess nipple conditions and the severity of sore nipples. Subsequently, the intervention group received aloe vera-based topical therapy twice daily for one week, while the control group received a placebo using the same schedule.

At the conclusion of the treatment period, both groups underwent a post-test to evaluate the effectiveness of aloe vera-based topical therapy products in addressing sore nipples. Mann-Whitney statistical analysis was employed to ascertain the difference in effectiveness between the two groups. The research adhered to ethical guidelines and received approval from the

Research Ethics Committee of the Faculty of Nursing, University of North Sumatra, with the ethical review number 2920/VIII/SP/2023.

### 3. RESULTS AND DISCUSSION

**Table 1.** Frequency Distribution of Control Group Pain Scores.

| Pain Scores | f  | %   |
|-------------|----|-----|
| 5           | 4  | 20  |
| 6           | 4  | 20  |
| 7           | 6  | 30  |
| 8           | 3  | 15  |
| 9           | 3  | 15  |
| Total       | 20 | 100 |

Table 1 present the results of univariate analysis in the control group showed that respondents experienced more pain on scale 7, namely 6 people (30%) and 15% each on scale 8.9.

**Table 2.** Frequency Distribution of Post Test Pain Scores in the Intervention Group.

| Pain Scores | f  | %   |
|-------------|----|-----|
| 0           | 13 | 65  |
| 1           | 7  | 35  |
| Total       | 20 | 100 |

Table 2.present the results of the univariate analysis showed that the majority of respondents experienced scale 0 as much as 65% after the aloe vera gel intervention, while the rest were only on scale 1, namely 35%.

**Table 3.** Results of Mann Whitney U-Test Analysis for Intervention Group and Control Group.

| Control group | N  | Mean Rank | Sum of Rank | z      | Mann Whitney U-Test |
|---------------|----|-----------|-------------|--------|---------------------|
| Pre-Test      | 20 | 30.50     | 610.00      | -5.537 | 0,001               |
| Post-Test     | 20 | 10.50     | 210.00      |        |                     |

Table 3 present the results of bivariate analysis using the Mann Whitney U-test showed a p-value of 0.001. So it can be concluded that there is an effect of aloe vera gel on reducing nipple pain, where aloe vera gel is 5,537 times more effective in reducing pain

The presented findings align with several prior studies that highlight the therapeutic potential of aloe vera in alleviating pain across various skin and tissue conditions. For instance, [Farzadinia, et al., \(2016\)](#) observed the anti-inflammatory effects of aloe vera, specifically noting its ability to alleviate pain associated with skin burns. Similarly, [Johnson et al. \(2020\)](#) demonstrated a significant reduction in pain intensity among postoperative patients through the topical application of aloe vera ([Farzadinia, et al., 2016](#); [Burusapat, et al., 2018](#)).

Aloe vera's pain-relieving properties can be attributed to its composition of natural anti-inflammatory and moisturizing compounds, including aloin and polysaccharides. These constituents likely contribute to the observed effects on pain and inflammation in the skin. Several mechanisms elucidate the pain-relieving effects associated with aloe vera gel, as follows ([Ruauw, Wantania, & Leman, 2016](#); [Abdoli, et al., 2020](#)): 1). Anti-Inflammatory Effects: Aloe vera contains salicylic acid and bradykininase, compounds known for their anti-inflammatory properties ([Eshun, & He, 2004](#)). These elements can mitigate the inflammatory response in the skin, consequently reducing pain perception ([Alamolhoda, Mirabi, & Mojab,](#)

2020), 2). Natural Moisturizing Effect: The inherent moisturizing components in aloe vera play a role in maintaining skin moisture, lowering the risk of nipple irritation that may lead to soreness (McClellan, et al., 2012; Pezeshki, et al., 2020), 3). Stimulation of Blood Circulation: Aloe vera gel exhibits the capacity to stimulate blood circulation in the applied area, enhancing the supply of nutrients and oxygen to the afflicted skin tissue. 4). Interaction with Pain Receptors: Various compounds present in aloe vera can interact with pain receptors on the skin, diminishing the sensation of pain that reaches the brain (Davis, et al., 1994).

These potential mechanisms collectively form a robust foundation for utilizing aloe vera gel in treating nipple pain (Patiran, Egam, & Kamalah, 2022). The synergistic combination of its anti-inflammatory properties, natural moisturizing effects, and the ability to enhance blood circulation positions aloe vera as a promising agent for reducing pain (Radha, & Laxmipriya, 2015).

These results are consistent with prior research emphasizing the therapeutic properties of aloe vera, particularly in meeting the distinctive needs of this demographic (Shahzad, & Ahmed, 2013). Despite recognizing the limitations inherent in our study, including the necessity for further exploration of long-term effects, the evidence presented herein implies that healthcare practitioners can consider aloe vera as a practical option in their recommendations for alleviating sore nipples. Looking ahead, it is imperative to persist in investigating complementary therapies like aloe vera to enhance the overall well-being of breastfeeding mothers and, consequently, foster successful breastfeeding experiences (Dewi, Hani, & Anwar, 2020).

#### 4. CONCLUSION

The findings of this research underscore the potential of topical aloe vera-based therapy as a valuable and accessible solution for addressing sore nipples in breastfeeding mothers. It can be inferred that aloe vera gel demonstrably influences nipple pain, with aloe vera gel proving to be 5,537 times more effective in pain reduction. Future research endeavors could benefit from the incorporation of objective measures, such as clinical assessments or laboratory analyses, to validate and strengthen the reported outcomes. This approach would further enhance the reliability and robustness of findings in the pursuit of advancing the understanding and implementation of effective interventions for breastfeeding-related concerns.

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