



THE EFFECTIVENESS OF ALOE VERA COMPRESSES IN REDUCING BODY TEMPERATURE IN CHILDREN WITH FEVER AGED 6–12 YEARS

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ABSTRACT

Children need a strong immune system so they are not easily infected with viruses and bacteria that can cause fever. For this reason, optimal attention is needed so that it is not easily infected by viruses and bacteria. There are other alternatives. Apart from using pharmacological drugs to lower a child's body temperature, the process of giving aloe vera compresses can also reduce the child's body temperature. Preliminary studies found that there are still some children who cannot take pharmacological drugs. To overcome this problem, an innovation was created in the form of an aloe vera compress which is believed to be able to reduce the body temperature of children with fever because it contains lignin and saponin. The aim of this study was to identify differences in children's body temperature before and after intervention. This research used a quasi-experiment with a one group pre test - post test design. The population was 15 respondents with fever aged 6-12 years using accidental sampling. The results of the comparison test before and after (paired t-test) showed a significance value of 0.00 (<0.05). This shows that the aloe vera compress is effective in reducing the body temperature of feverish children aged 6-12 years. Based on the average (mean) body temperature before the intervention (pre test) it was found to be 38.480 and the average (mean) body temperature after the intervention (post test) was 37.833.

Keywords: aloe vera; children's body temperature; fever

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INTRODUCTION

School-aged children are those aged 6–12 years, a period during which they acquire the foundational knowledge and skills necessary for successful adaptation to adult life. School becomes a central experience for children, as they are expected to begin taking responsibility for their own behavior in relation to parents, peers, and others (Wong, 2019). At this age, children tend to form groups (gang age); they begin to shift their focus from close family relationships and start collaborating with peers in behavior or learning. Consequently, school-aged children increasingly spend most of their time with their peers (Gunarsa, 2020). Common issues among school-age children include a lack of motivation, various distractions such as peers disrupting their focus on learning, poor concentration, difficulty remembering, and spending excessive time in unhealthy environments—such as playing without regard for hygiene or eating unhygienic snacks—which can lead to viral or bacterial infections and result in the child developing a fever.

Fever is the body's natural process to combat infections entering the body. Fever occurs at a temperature $> 37.5^{\circ}\text{C}$, typically caused by infections, autoimmune diseases, malignancies, or medications. Fever can also result from the body's inability to regulate heat loss, failing to balance excessive heat production, leading to an increase in body temperature (Bagus, 2019). According to the World Health Organization (WHO), the estimated number of fever cases worldwide ranges from 16 to 33 million, with 500,000 to 600,000 deaths annually. Data indicates that 62% of illnesses accompanied by fever occur in children, with a relatively high mortality rate of 33%, the highest incidence being in South Asia and Southeast Asia (WHO, 2018).

The impacts of frequent fever in children can include anxiety, stress, and phobias for parents. One potential consequence when fever is not promptly addressed and body temperature rises excessively is dehydration, lethargy, loss of appetite, and even life-threatening seizures (Cahyaningrum, Anies, & Julianti, 2019). There are several methods to reduce and manage fever, including the administration of antipyretic medications. However, the use of antipyretics carries side effects, such as bronchospasm, gastrointestinal bleeding resulting from vascular erosion, and impaired kidney function (Cahyaningrum & Putri, 2017). In addition to using antipyretic medications, fever can be reduced through physical (non-pharmacological) methods, such as providing plenty of fluids, keeping the patient in a room with normal temperature, using lightweight clothing, and applying compresses (Nurarif, 2018).

Non-pharmacological measures that can be implemented include additional steps to reduce fever, such as providing ample fluids, keeping the child in a room with normal temperature, wearing lightweight clothing, and applying compresses (Wati, 2020). Non-pharmacological treatments for managing fever in children include the use of compresses; these do not necessarily have to be warm or cold, but can also utilize Aloe vera compresses, as Aloe vera has been shown to possess antipyretic effects (Wardiyah et al., 2019).

Aloe vera compresses are quite effective in accelerating the release of heat from the body due to their saponin content. Aloe vera contains lignin, which can penetrate the skin and prevent fluid loss from the skin's surface. Aloe vera therapy is used because it consists of 95% water, which helps prevent allergic reactions on the skin (Barus, 2020). The lignin content in aloe vera gel protects the skin from dehydration and maintains its moisture. Aloe vera has been shown to contain substances with antipyretic effects, as demonstrated by research conducted by Fajariyah (2020) at the Hilir Community Health Center in Pontianak City, West Kalimantan.

This method of heat dissipation using an aloe vera compress operates on the principle of conduction. Through this method, heat from the body is transferred into the aloe vera. Conduction occurs between the temperature of the aloe vera and the surrounding tissues, including blood vessels, thereby lowering the temperature of the blood flowing through that area. The blood then flows to other parts of the body, and the conduction process continues even after the aloe vera compress is removed. Aloe vera contains lignin and saponins, which can dilate blood vessels and lower body temperature (Bagus, 2019).

The mechanism by which lignin helps lower a child's body temperature is due to its high absorption capacity, allowing it to penetrate pores and cells more quickly. Aloe vera gel has a natural pH similar to that of human skin, so it does not cause skin allergies in users (Fajariyah, 2020). Previous studies have been conducted on the effect of aloe vera compresses on the body temperature of preschool-aged children with fever at the Siantar Hilir Community Health Center by asegef (2017). The results showed that the application of aloe vera compresses significantly reduced body temperature in febrile patients by 0.488°C. Additionally, a study on the effect of aloe vera compresses on reducing body temperature in children aged 3–6 years with fever was conducted at the Nusukan Community Health Center by Purnomo (2019). The results showed a decrease in the children's body temperature after receiving aloe vera compresses, with the average temperature dropping from 38.12°C to 37.42°C. Based on the background above, the researcher is interested in conducting research aimed at determining the effectiveness of giving aloe vera compresses on the body temperature of children with fever aged 6–12 years.

METHOD

The type of research used was a *quasi-experimental* study employing a one-group pre- and post-test design. This study was conducted from May 20 to June 30, 2024, at the Atika Maternity and Child Health Clinic (PMB Atika) in 2024.

The research location was selected because PMB has many pediatric patients with fever. The sample size for this study was 15 respondents. The sampling technique used in this study was *accidental sampling*, which is a sampling method based on chance; that is, anyone who happens to encounter the researcher can be selected as a sample if they are deemed suitable as a data source. Sample criteria included inclusion and exclusion criteria: children aged 6–12 years with fever, no complications, willing to participate, and who had not yet taken pharmacological medication. This study was conducted by administering a 15-minute treatment with a 5-gram dose of *Aloe Vera*. The researcher used an observation sheet to assess the intervention before and after the application of the *Aloe Vera* compress. Data were analyzed using the Shapiro-Wilk normality test, followed by a paired t-test.

RESULT

Univariate Analysis

This analysis aims to explain or describe the characteristics of each research variable; generally, this analysis only produces frequency distributions and percentages for each variable.

Table 1.
Frequency Distributon of Respondent Characteristics Based on Child Age

Respondent Characteristics	Respondents	
	f	%
Age (Years)		
6	7	47
7	3	20
8	2	14
9	0	0
10	2	14
11	0	0
12	1	5

The results of the study involving 15 respondents show that there were 7 (47%) respondents aged 6 years, 3 (20%) respondents aged 7 years, 2 (14%) respondents aged 8 years, 0 (0%) respondents, 2 (14%) were 10 years old, 0 (0%) were 11 years old, and 1 (5%) was 12 years old.

Bivariate Analysis

Bivariate analysis was conducted using statistical tests to examine differences in the means of the dependent variables. Before analyzing the data, the *Shapiro-Wilk* test was first performed; if the data were normally distributed, the analysis proceeded using a *paired t-test*.

Table 2.
Shapiro–Wilk Normality Test

Variable	Group	N	Sig
Body Temperature	Pre-Test	15	0.063
	Post-Test	15	0.642

Based on Table 2 above, it is known that the normality test using *the Shapiro–Wilk* test yielded a significant result, namely > 0.05 (0.063), for the distribution of body temperature data before the intervention, and a significant result was also obtained for the distribution of body temperature data after the intervention, namely > 0.05 (0.642). Since the results are normally distributed, a parametric test using the Wilcoxon test is not necessary, and the analysis proceeds with the *paired t-test*.

Table 3.
Paired t-Test

Variable	N	Mean	SD	P-Value
<i>Pre-test</i>	15	38.480	0.5519	0.00
<i>post-test</i>	15	37,833	0.4639	

Based on the SPSS output results, it can be seen that the significance value of *the paired t-test* is 0.00, which is less than 0.05; therefore, this indicates that the application of *Aloe Vera* compresses is effective in reducing children's body temperature.

DISCUSSION

Univariate Analysis

In the study conducted by the researcher involving 15 respondents, it was found that 7 (47%) of the respondents were pregnant women aged 6 years. Research findings indicate that fever is most common among children aged 6–7 years; this aligns with the theory proposed by Hardinsyah and Supariasa (2019), who state that younger children are often in environments where they have greater exposure to pathogens—whether at playgrounds or through eating from unsanitary food vendors—and that their immune systems have not yet fully developed. This makes them more susceptible to viral or bacterial infections that can cause fever. Meanwhile, older children tend to pay more attention to their eating and play habits because they have begun to understand the importance of maintaining proper behavior and have developed good hygiene habits, such as handwashing (Hidayat, 2019).

This aligns with a study conducted by Utami (2019) titled "Determinants of Personal Hygiene in Children Aged 9–12 Years," which discusses how, during school-age years, children engage in numerous activities that often involve direct contact with dirty environments, making them more susceptible to illness. A lack of knowledge and awareness among parents regarding their children's *personal hygiene* leads children to neglect their own cleanliness, including nail care. Although it may seem minor, nail care is also an important aspect that must be addressed (Wong, 2019).

Based on Table 4.2, where 15 respondents underwent an intervention prior to receiving an *Aloe Vera* compress—specifically, body temperature measurement using a thermometer—the body temperatures recorded before the intervention ranged from 37.7°C to 39.3°C. This aligns with Breman's (2021) theory, which states that the average body temperature of children in Indonesia is approximately 36°C–37.5°C. Children's body temperatures can vary throughout the day, typically being lower in the morning and slightly higher in the afternoon or evening. Physical activity and the environment can also influence their body temperatures. This aligns with a study conducted by Bagus (2018) titled "The Application of *Tepid Water Sponge* for Reducing Body Temperature in Children Aged 1–5 Years," which discusses that normal body temperature in children ranges from 36°C to 37.5°C. Therefore, a child is considered to have a fever when their body temperature exceeds 37.5°C. Fever is a form of the body's defense mechanism against disease (Djuwariah & Yulistiani 2017). A child's body temperature is always a primary concern as it indicates whether the child is truly healthy or not. An increase in a child's body temperature can be observed during a fever by checking with a thermometer; if the child's body temperature is high, it poses a risk to their immune system, leading to the child experiencing a fever (Breman, 2021).

Bivariate Analysis

Based on Table 3, it is known that the *Shapiro-Wilk* normality test yielded significant results of 0.173 (*pre-test*) and 0.174 (*post-test*). This indicates that the *pre-test* and *post-test* data are normally distributed because the p-value is >0.05 . This aligns with the theory at (2021), which states that the *Shapiro-Wilk* test is used to assess the distribution of data in a small sample, typically involving data sets with no more than 50 observations. The criteria for using the *Shapiro-Wilk* normality test are as follows: if the data is normally distributed and the significance value is > 0.05 , the analysis can proceed to a *paired t-test*. However, if the significance value is < 0.05 , the data is considered not normally distributed.

The results of the *paired t-test* were 0.000. This indicates that the p-value is less than 0.05; therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted, meaning that *Aloe vera* compresses are effective in reducing children's body temperature. The average change in body temperature reduction in febrile children before and after the intervention was 0.46°C. This average result meets the operational standard, which stipulates that the reduction in the child's body temperature must be $\geq 0.46^\circ\text{C}$ within 15 minutes after the application of the *Aloe vera* compress. This proves that the *Aloe vera* compress can influence the reduction in the child's body temperature.

Based on Table 3, data shows that body temperature ranged from 37.1°C to 38.6°C after the intervention. This indicates that applying an *Aloe vera* compress can lower a child's body temperature. This is consistent with a study conducted by Assegaf (2017) titled "The Effect of Aloe Vera Compresses on the Body Temperature of Preschool Children with Fever at the Siantan Hilir Community Health Center." The results showed that statistical analysis using the Wilcoxon test

indicated that the application of aloe vera compresses had a significant effect on changes in body temperature in patients with fever, with a *p-value* of 0.001 ($\alpha < 0.05$), with a temperature reduction of 0.488 °C.

Aloe vera compresses are quite effective in accelerating heat dissipation from the body due to the presence of saponin compounds. Aloe vera contains lignin that can penetrate the skin and prevent fluid loss from the skin's surface. Aloe vera therapy is used because it contains 95% water content, thereby helping to avoid allergic reactions on the skin (Barus, 2020). The lignin content in *aloe vera* gel protects the skin from dehydration and maintains its moisture. *Aloe vera* has been proven to contain substances with antipyretic effects, as demonstrated by research conducted by Fajariyah (2020) at the Hilir Community Health Center in Pontianak City, West Kalimantan.

This method of heat dissipation using an aloe vera compress operates on the principle of conduction. Through this method, heat from the body is transferred into the aloe vera. Conduction occurs between the temperature of the aloe vera and the surrounding tissues, including blood vessels, thereby lowering the temperature of the blood flowing through that area. The blood then flows to other parts of the body, and the conduction process continues even after the aloe vera compress is removed. Aloe vera contains lignin and saponins, which can dilate blood vessels and lower body temperature (Bagus, 2019).

The mechanism by which lignin helps lower a child's body temperature is due to its high absorption capacity, allowing it to penetrate pores and cells more quickly. Aloe vera gel has a natural pH similar to that of human skin, so it does not cause skin allergies in users. Based on the results of this study, the researchers assume that fever in children aged 6–12 years can be reduced by applying an *Aloe Vera* compress, which is a non-pharmacological treatment capable of lowering a child's body temperature. The presence of lignin and saponins in *Aloe Vera* helps dilate blood vessels in the skin and reduce the body temperature of children with fever.

CONCLUSION

- a. Based on the mean body temperature before the intervention (pre-test), the result was 38.480, and the mean body temperature after the intervention (post-test) was 37.833.
- b. The results of the paired t-test showed a *p-value* of 0.00 ($p < 0.05$), indicating that the aloe vera compress is effective in reducing body temperature in children with fever aged 6–12 years.

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