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Efficacy of Warm Water Compress and Aloe Vera Therapy for Fever Management in Preschoolers: A Study at Cempaka High Care Unit, Dr. Moewardi Hospital

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Abstract

Background: Hyperthermia is a condition that often occurs in preschool children due to infection or inflammation. If not treated immediately, hyperthermia can cause complications such as dehydration and febrile seizures. One safe and effective non-pharmacological method is warm water compresses, which help lower body temperature by increasing heat evaporation and stimulating vasodilation, thereby improving blood circulation. **Objective:** This study aims to determine the effectiveness of warm water compresses in lowering body temperature in preschool children with hyperthermia in the Cempaka High Care Unit of Dr. Moewardi Hospital, Surakarta. **Method:** This study used a descriptive case study method on two children with hyperthermia. Body temperature was measured before and after giving warm water compresses for 15-20 minutes every 4 hours. **Results:** Child Patient S's body temperature decreased from 39.0°C to 36.4°C and Child Patient M's from 38.2°C to 36.2°C within 24-48 hours after the intervention. **Conclusion:** Warm water compresses have been proven effective, safe, and simple as a non-pharmacological method in lowering the body temperature of preschool children.

Keywords: Preschool children, Hyperthermia, Warm water compresses, Aloe vera

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1. BACKGROUND

The preschool period is a period that covers the ages of 3 to 6 years, often referred to as the golden age, where children experience very rapid growth and development during this period (Saragih et al., 2023). This period is also known as "The Wonder Years," when children are inquisitive about various things and increased physical activity, which often causes fatigue. In addition, an unstable immune system or weak immune system makes children susceptible to disease and often requires hospitalization (Putri et al., 2020). Hyperthermia, more commonly known as fever, is one of the symptoms in

children characterized by an increase in body temperature due to the activity of the temperature regulation center in the hypothalamus (the part of the brain that regulates body temperature). In children, fever usually occurs when body temperature increases to 37.5–38℃ or more. If not treated quickly, fever can cause serious complications, such as brain damage, hyperpyrexia (extreme fever) that triggers shock, epilepsy, mental developmental delays, learning difficulties, and seizures (Malla et al., 2020).

According to data from the World Health Organization (WHO), in 2022, the incidence of fever worldwide reached 17 million cases per year, with a mortality rate of 600,000, of which 70% of cases occurred in Asia (WHO, 2022). Based on basic health research in Indonesia in 2020, the prevalence of fever reached 1.5% of the population, with the highest prevalence in children aged 1 to 4 years. In Central Java, the incidence of fever in children is quite high, especially at Dr. Moewardi Surakarta Hospital, which recorded 44,422 cases of fever in children in 2019, increasing to 46,142 cases in 2020 (Ministry of Health, 2020)

Warm water compresses are a non-pharmacological method to lower body temperature by thoroughly wiping the body and compressing certain areas using warm water for a specific period. The warm water in the warm compress helps stimulate vasodilation of peripheral blood vessels, thereby accelerating the transfer of heat from the body to the environment. In addition to warm water compresses, aloe vera is used because of its polysaccharide and salicylic acid content, which provide anti-inflammatory effects, cool the skin, and help lower body temperature safely in children. Applying a warm water compress to an area with many blood vessels will cause significant vasodilation, so the heat transfer process can occur up to eight times faster (Annisa et al., 2024).

Aloe vera has various medical properties, including antipyretic properties that help reduce fever. The content of active compounds such as aloin, salicylic acid, and polysaccharides in aloe vera is believed to relieve inflammation, lower body temperature, and provide a calming effect. With these properties, aloe vera has the potential to be a natural alternative that supports fever management, especially in cases of mild fever (Putri et al., 2020).

Based on research conducted by (Saragih et al., 2023) showed that warm water compresses are effective in reducing fever by applying warm water at a

temperature of 37°C for 15 minutes in several areas with large blood vessels, such as the neck, armpits, and groin, and wiping other body areas. Another study by Arista (2023) stated that warm water compresses are more effective than other methods because they are applied to five main points (neck, two armpits, and two groins), as well as wiping the stomach and chest (Putri et al., 2020). Dr. Moewardi Hospital is the primary referral hospital in Central Java that handles various pediatric cases, including fever in children. In the Cempaka High Care Unit, cases of childhood fever are often one of the main focuses of medical treatment. According to data from Dr. Moewardi Hospital, in 2023, there were an average of 20-30 fever cases in children each month that required treatment in the High Care Unit. This shows the need for effective and efficient methods, such as warm compresses, in treating fever in children. This study aims to evaluate the effectiveness of applying warm compresses and aloe vera in reducing fever in children in the Cempaka High Care Unit of Dr. Moewardi Hospital. This intervention was chosen because warm compresses are a non-pharmacological method proven effective in reducing body temperature through external cooling. At the same time, aloe vera has anti-inflammatory properties and a calming effect that can support the process of reducing fever naturally. By combining these two methods, this study is expected to provide a safe, efficient, and evidence-based alternative for treating fever.

2. METHODS

This study uses a case study method. The design used is a descriptive case study that aims to describe the results of the intervention's implementation. In this study, the implementation focused on applying the warm water compress and aloe vera method to reduce fever in preschool children. The researcher conducted a series of nursing procedures, from an assessment to collect data, searching for supporting literature, to evaluating the results of the intervention in patients treated in the Cempaka High Care Unit, Dr. Moewardi Hospital. The subjects of this study were hospitalized patients in the Cempaka High Care Unit, Dr. Moewardi Hospital. The study was conducted on preschool children (3 to 6 years) who had a fever. The study subjects involved 2 patients who were observed in depth while applying warm water compresses and aloe vera, with the criteria of children with a body temperature of more than 38^0C, accompanied by parents

or family members during the procedure. Exclusion criteria: children with a history of uncontrolled febrile seizures, children with certain skin conditions (such as allergies or irritation) that inhibit the use of aloe vera, and children in unstable conditions such as signs of shock or impaired consciousness.

The data obtained will be tabulated to facilitate the process of observation, analysis, and interpretation. Data processing by comparing body temperature before and after the intervention to determine any temperature changes that occur due to the application of a combination of warm water compresses and aloe vera.

Researchers apply research ethics by providing informed consent as approval and ensuring that the intervention in the study does not endanger the patient's condition by implementing intervention operational standards.

3. RESULTS

The warm water compress and aloe vera method was applied to lower body temperature during the research period on February 4-6, 2025. The results of the application of warm water compresses and aloe vera to reduce body temperature in preschool children aged 3-4 years in the Cempaka High Care Unit of Dr. Moewardi Surakarta Hospital were carried out on February 4-6, 2025, involved 2 respondents with a medical diagnosis of Children S's respiratory distress and Children M's pneumonia.

Table 1. Body Temperature in Children S and Children M before and after Treatment with Warm Water and Aloe Vera Compress

Respondent	Temperature	
	Before	After
Children S	39,0^{0}C	36,8^{0}C
Children M	38,2^{0}C	36,2^{0}C

Table 1 shows the results of Child S's body temperature before the warm water and aloe vera compress was 39.0^{0}C, after the warm water and aloe vera compress was 3 times a day, it became 36.8^{0}C and in Child M before the warm water and aloe vera compress was 38.2^{0}C, after the warm water and aloe vera compress was 3 times a day it became 36.2^{0}C.

Table 2. Results of Body Temperature Reduction in Child S and Child M Before and After Compress with Warm Water and Aloe Vera

Intervention	Children S	Children M
Before intervention	39,0^{0}C	38,2^{0}C

After intervention	36,8^{0}C	36,2^{0}C
Body temperature decrease	2,2^{0}C	2,0^{0}C

Table 2 shows that the application of warm water compresses and aloe vera effectively decreases the body temperature of both respondents. Respondent Child Children S experienced a decrease in temperature of 2.2°C, from 39.0°C to 36.8°C, while Child M experienced a decrease in temperature of 2.0°C, from 38.2°C to 36.2°C after the intervention. In addition, after three daily interventions, Child S showed improvements, such as reduced fussiness and increased appetite.

4. DISCUSSION

Body temperature decreases in respondents before and after warm water compress and aloe vera application

Based on the observation results, the body temperature of both respondents before the warm water compress and aloe vera application showed a significant fever condition. Children S had a body temperature of 39.0°C, while Children M had a body temperature of 38.2°C. This condition is caused by infections such as pneumonia and respiratory distress. By the author's assessment, Children S experienced respiratory distress while Children M experienced pneumonia. The infection triggers an inflammatory response in the body, which causes an increase in temperature, which acts as a defense mechanism against pathogens.

Warm water compress and aloe vera have been proven effective in lowering body temperature in children with fever. This method is a safe and effective non-pharmacological alternative. Before the intervention, Children S's body temperature was 39.0°C, and Children M's was 38.2°C. After three days of application, Children S's body temperature dropped by 2.2^{0}C from 39.0°C to 36.8^{0}C, and An. M's body temperature dropped by 2.0^{0}C from 38.2^{0}C to 36.2°C. This shows a significant change in the management of hyperthermia in children. The effectiveness of warm water compresses is associated with the vasodilation mechanism that helps accelerate heat release through the skin. Aloe vera, which have a more water composition and anti-inflammatory properties, helps soothe the skin and accelerate the natural process of lowering the temperature. In addition, the hydration effect of aloe vera helps maintain the child's body fluid balance during fever. Zakiyah's (2022) research supports this, with results showing an average temperature decrease

of 1°C–2°C after 15 minutes of applying aloe vera compresses. Based on the description in line with (Siagian et al., 2021), the combination of warm water compresses and aloe vera not only effectively lowers body temperature but also provides psychological benefits for children. Holistic care that includes physiological and psychological aspects is considered superior to a single approach that only focuses on lowering temperature. This approach is also considered safe, non-invasive, and easy to implement in the home environment or health facilities.

Comparison of body temperature decreases in childrens before and after applying warm water compresses and aloe vera

The comparison results showed significant changes in body temperature in both respondents. Children S experienced a decrease in temperature from 39.0°C to 36.8°C, with a total decrease of 2.2°C. Meanwhile, Children M experienced a decrease in temperature from 38.2°C to 36.2°C, with a total decrease of 2.0°C.

The comparison of effectiveness showed that in Children S, the temperature decrease occurred more quickly in the first 30 minutes, while in Children M, the decrease occurred more gradually in the first 45 minutes. Although there was a difference in response time, these results prove that combining warm water compresses and aloe vera effectively lowers body temperature in both respondents. The difference in response time is likely due to each individual's physical condition and metabolism. Further monitoring is needed to ensure body temperature stability after the intervention.

The results align with Wardaniyah's (2020) study in that the differences in the level and speed of body temperature decrease are related to the underlying medical conditions experienced by each respondent. Children S, who experienced respiratory distress, tended to respond faster to warm water compress and aloe vera therapy, while Children M, who experienced pneumonia, took longer due to the bacterial infection in the lungs. Therefore, although both intervention methods have proven effective, the duration and level of temperature decrease may vary depending on the medical condition of each respondent.

The limitation of this study lies in the intervention of warm water compress and aloe vera, which only acts as a complementary therapy to the administration of antipyretics, so the decrease in body temperature is not entirely due to this intervention. In addition, researchers also need to pay

attention to the schedule for administering paracetamol, which is generally given every 4–6 hours, to prevent spikes in body temperature that can trigger febrile seizures. Regularly monitoring body temperature and information regarding the initial time of fever symptoms is essential, especially in children diagnosed with respiratory distress or pneumonia, to ensure appropriate intervention and prevent further complications.

5. CONCLUSION

The main infection caused the increase in body temperature in both respondents, namely respiratory distress in ChildrenS and pneumonia in ChildrenM, with several supporting factors such as dehydration and late early intervention. After applying warm water compresses and aloe vera, the body temperature of both respondents showed a significant decrease. ChildrenS dropped from 39.0°C to 36.8°C, while ChildrenM dropped from 38.2°C to 36.2°C. The combination of warm water compresses and aloe vera has been proven effective as a non-pharmacological method to lower body temperature in children with fever. This method follows the theory of vasodilation and natural cooling effects and can be an initial choice before administering antipyretics.

The comparison results showed that ChildrenS experienced a decrease in temperature of 2.2°C, while ChildrenM was 2.0°C. This confirms that the method's effectiveness can vary depending on the patient's medical condition. Thus, combining warm water compresses and aloe vera is an effective non-pharmacological intervention and is worth considering in treating fever in preschool children. Patients with fever are advised to apply warm water compress therapy and aloe vera as an alternative non-pharmacological treatment in treating fever in children before using antipyretic drugs.

AUTHOR CONTRIBUTIONS

The author contributes all research activities. Conceptualization, analysis, writing and manuscript revisions.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest in this research.

DATA AVAILABILITY STATEMENT

The data are available from the corresponding author upon reasonable request.

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