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Implementation Of Compress Therapy (Aloevera) In Pre-School Children With Hyperthermia Due To Dengue Hemorrhagic Fever At Arjawinangun Hospital, Cirebon Regency

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Abstract:
Background: *Dengue Hemorrhagic Fever* (DHF) is a disease caused by the dengue virus that often attacks children, especially in preschool-age children. Children who experience DHF will exhibit signs and symptoms such as hyperthermia. One of the non-pharmacological methods that can be used to reduce hyperthermia in children is with compresses (aloe vera).
Aims. To explore the implementation of compress therapy (aloe vera) as a non-pharmacological intervention to reduce hyperthermia in preschool-aged children diagnosed with DHF.
Methods: The research design used was descriptive, rather than a case study approach, with two pre-existing children. Schools that experience hyperthermia due to DHF. Compress intervention (aloe vera) will be given for five days, with a duration of 15 minutes.
Results: The study was conducted on pre-school children. Both have the same medical diagnosis, i.e., DHF. The intervention was in the form of compress therapy (aloe vera). After 5 days of intervention on both subjects, there was a change: Subject 1 experienced a decrease in body temperature on the third day, while Subject 2 experienced a reduction on the second day.
Conclusion: The implementation of compress therapy (aloevera) has been proven to lower body temperature in preschool-aged children with hyperthermia due to DHF.
Implementation. Aloe vera can be used as an alternative to non-pharmacological interventions that are safe, natural, and easy to apply.

Keywords: Dengue Hemorrhagic Fever (DHF), Hyperthermia, Compresses (Aloe vera), preschool children

INTRODUCTION

Pre-school children are an age group that is experiencing rapid growth and development, both physically, cognitively, and socially-emotionally. At this stage, children are very active in playing and interacting with the environment, so they are susceptible to

various diseases, including infectious diseases such as Dengue Hemorrhagic Fever (DHF) (Elling et al., 2013).

Dengue Hemorrhagic Fever (DHF) is an acute infectious disease caused by the dengue virus, transmitted through the bite of the Aedes aegypti mosquito. This disease often affects children, especially those who live in tropical regions such as Indonesia. One of the main symptoms of DHF is hyperthermia, which, if not treated properly, can lead to serious complications, including death. (Alam et al., 2009)

The data shows that children <5 years old are the group with the highest mortality rate due to DHF, reaching 38.89% (Ministry of Health of the Republic of Indonesia, 2024). In West Java, thousands of cases of DHF in children are recorded every month, with fluctuating but still significant mortality rates. (Costa, 2024). Treatment of hyperthermia can be done pharmacologically or non-pharmacologically. One of the practical and safe non-pharmacological methods to reduce hyperthermia is compresses, specifically using herbal plants such as Aloe vera (aloe vera) (Anushri et al., 2015). Aloe vera contains chemical compounds, namely saponins and lignin, that can penetrate the skin's layers, helping prevent fluid loss from its surface. In addition, saponins and lignin have a relaxing effect, which can transmit signals to the posterior hypothalamus. (Chaitanya & Singh, 2016). In addition, Aloe vera contains about 95% water, which helps the body dissipate heat. (Nagansurkar et al., 2024).

Dengue Hemorrhagic Fever (DHF) is still a significant health problem in children, especially preschool age, with hyperthermia being the dominant clinical manifestation that has the potential to cause serious complications. The approach to managing hyperthermia in children is generally divided into pharmacological (antipyretic) and non-pharmacological. In recent years, non-pharmacological interventions have received more attention because they are considered safe, easy to apply, and have minimal side effects.

Various previous studies have shown that compresses are a non-pharmacological method that is effective in lowering children's body temperature. Compressed media that are widely researched include warm water, cold water, and natural materials. Among these natural ingredients, Aloe vera is increasingly being studied due to its high water content (±95%) and active compounds, such as saponins and lignin, which play a role in the heat conduction mechanism and the stimulation of the temperature-regulating center in the hypothalamus.

Several previous studies have demonstrated the effectiveness of Aloe vera compresses in lowering body temperature in children with fever due to various conditions, including post-immunization fever and non-specific fever. However, most of those studies, carried out in a community health center setting, used quasi-experimental designs or single-case reports and did not explicitly focus on preschoolers with dengue, nor did they systematically study the nursing implementation process according to standard operating procedures (SOPs).

Thus, although evidence for the effectiveness of Aloe vera as a compress medium is growing, studies that integrate clinical aspects, pediatric nursing, the dengue context, and the implementation of nursing practices in hospitals remain limited.

Based on this, this study aims to implement compress therapy (aloe vera) to lower the body temperature of preschool-aged children experiencing hyperthermia due to DHF at Arjawinangun Hospital, Cirebon Regency.

LITERATURE REVIEW

Dengue Hemorrhagic Fever (DHF) is a global health threat, especially in tropical countries such as Indonesia. This acute infectious disease is caused by dengue viruses of the genus *Flavivirus*, family *Flaviviridae* (Sari et al., 2023). This virus belongs to the rabsovirus B group. It has four serotypes (DEN-1, DEN-2, DEN-3, and DEN-4) that are transmitted to humans mainly through the bite of female *Aedes aegypti* mosquitoes, as well as *Aedes albopictus* (Sari et al., 2023; Hidayati et al., 2024). DHF can affect all age groups, but children, including preschoolers, are particularly vulnerable due to their activities and developing immune systems.

Clinically, DHF is characterized by a sudden high fever that lasts 2-7 days, accompanied by severe headache (often behind the eyes), myalgia, arthralgia, skin rash, and bleeding manifestations (Yulianto et al., 2023). Apriana et al. (2023) added that DHF is an inflammatory disease characterized by leukopenia, rash, lymphadenopathy, thrombocytopenia, and bleeding. A characteristic of the pathophysiology of DHF that distinguishes it from common dengue fever is plasma leakage, which is characterized by an increase in hematocrit or accumulation of fluid in the body cavity, and can proceed to dengue shock syndrome (Apriana et al., 2023; N. A. M. E. Sari et al., 2023). Based on its severity, DHF is classified into four stages. Stage 1 is characterized by fever and a positive tourniquet test; Stage 2 appears with spontaneous bleeding; Stage 3 is characterized by early circulatory failure (fast and weak pulse, narrowed pulse pressure); and Stage 4 in the form of severe

shock (Dengue Shock Syndrome) with an unpalpable pulse and immeasurable blood pressure (Kumalasari et al., 2024).

One of the primary manifestations and nursing problems that often arise in DHF patients, especially children, is hyperthermia. Hyperthermia is a condition in which the body temperature rises above the normal range of 37.5°C (PPNI, 2017; Dillasamola et al., 2024). According to Nofitasari & Wahyuningsih (2019), hyperthermia is characterized by high body temperature, reddish, warm skin, tachycardia, tachypnea, and the potential to cause convulsions. In children, the causes of hyperthermia vary, but in the context of DHF, the increase in body temperature is mainly caused by a systemic inflammatory response due to viral infection (Dillasamola et al., 2024). The pathophysiology of hyperthermia in DHF begins with the entry of the virus into the bloodstream, causes viremia, and affects the hypothalamus, which acts as the body's thermostat, so that the body temperature benchmark increases (Sari et al., 2023).

The subject group in this scientific paper is preschool children. According to Hinonaung et al., (2023), preschool children are early childhood (3-6 years old) who have not yet entered formal education, experiencing significant growth and development in physical aspects, skills, and thought processes. Narullita (2022) defines them as children who are beginning to prepare to enter the world of formal education through play groups, getting to know the environment outside the home, and making friends. At the stage of Erikson's psychosocial development, this age child is in the phase of Initiative vs. Guilt, where curiosity and imagination flourish but can also easily feel guilty (Putri & Iskandar, 2021). The physical growth during this period is characterized by an increase in height of 6.5-7.8 cm per year and a gain in body weight of about 2.3 kg per year (Rokhmiati et al., 2024). Cognitive development is in the pre-operational stage according to Piaget, moral development is in the pre-conventional stage according to Kohlberg, and gross and fine motor skills are developing (Suryana, 2016). This unique characteristic demands a special nursing approach, including in the administration of therapeutic interventions such as compresses, where the child's level of cooperation, fear, and comfort greatly influences the success of the action.

Management of hyperthermia can be done through two main approaches: pharmacological and non-pharmacological. Pharmacological therapy involves administering antipyretics, while non-pharmacological therapies include actions such as compresses, wearing thin clothing, increasing fluid intake, and keeping the environment cool. (Kaushik

et al., 2010). Compresses, as a non-pharmacological modality, have long been used in the treatment of fever patients. Burhan & Rauf, (2020) Defines compresses as a non-pharmacological therapeutic method used to aid healing without medication. The purpose of the compress, according to Princess Oktaviana, et al (2024) Is to facilitate blood circulation, lower body temperature, provide a sense of comfort and calm, and reduce pain. In practice, there are various types of compressed media, one of which has received attention is the use of natural ingredients such as aloe vera (*Aloe vera*).

Aloe vera compress is a non-pharmacological intervention to lower body temperature in children with fever, using aloe vera gel or meat as the compress medium. Wati et al., (2024) Defines it as a method that uses conduction to reduce body heat. Lim & Cheong, (2015) Explains that aloe compresses contain saponin and lignin compounds that play a role in accelerating heat excretion from the body. (Marimbun, 2021) Call it fever therapy that uses natural plant media. The mechanism of action of aloe vera compress in lowering fever is based on two primary principles. First, the principle of physical conduction, where body heat transfers to aloe vera gel, which has a lower temperature, mainly because of its water content, which reaches 95% (Amelia et al., 2023; Maliah, 2023). Second, the pharmacological principle of its active compounds. Astuti et al. (2017) explain that the saponins and lignins in aloe vera can penetrate the skin and signal the posterior hypothalamus, the part of the brain that regulates temperature, thereby triggering a decrease in body temperature. Additionally, aloe vera's natural properties are safe, rarely cause allergies, and provide a cold sensation to the skin, making it an ideal choice for sensitive children's skin (Maliah, 2023).

Several previous studies have supported the effectiveness of aloe vera compress therapy. Septarina et al. (2022) concluded in their study that the administration of aloe vera compresses affects body temperature in children with fever. The study lasted 15 minutes and measured axillary temperature before and after the intervention. Eva Muzdhalifah As Seggaf (2017) reported varied results from the use of aloe vera compresses at the Siantan Hilir Health Center. Of the 16 respondents, 14 reported a temperature drop of 0.1-1°C, while 2 reported no change. This variation suggests that individual factors can influence the therapeutic response. A case study by Agisna & Annisa (2024) provides a more detailed picture of the pattern of temperature drops. In the first subject, body temperature dropped from 37.4°C to 37.1°C between the first and second days, and in the second subject, it

dropped from 37.7°C to 37.5°C over three days. These empirical data corroborate the position of aloe vera compresses as a viable alternative to intervention.

Implementing aloe vera compress therapy in nursing care must follow standard procedures to ensure safety and effectiveness. The Standard Operating Procedure (SPO) referenced from PPNI (2021) outlines comprehensive steps, starting from the pre-interaction phase (preparation of tools and materials such as aloe vera, instrument beds, handscoons, digital thermometers, and gauze), orientation phase (providing explanations and informed consent, asking for allergy history), work phase (measuring the initial temperature, placing aloe vera that has been peeled and wrapped in gauze on the forehead for 15 minutes, re-measuring temperature), to the termination phase (tidying up the patient and equipment, and documenting). This structured procedure not only ensures the technical aspects but also considers therapeutic communication and the comfort of the pediatric patient.

In theory, the conceptual framework of this study views aloe vera compress therapy as an independent variable that is expected to affect dependent variables, namely hyperthermia conditions in children with DHF. The compiled theoretical framework shows a causal chain: Etiology (Dengue Virus) causes clinical manifestations of DHF (including fever), which then requires management. One of the options in non-pharmacological management is compress therapy, and in this case, compresses with a specific medium, namely aloe vera. Thus, this literature review has outlined a strong scientific basis, ranging from the concept of the disease and the characteristics of the subject to the definition and mechanism of the intervention, as well as evidence of its effectiveness and implementation standards. This provides a solid foundation for implementing aloe vera compress therapy in the nursing care of preschool-aged children with DHF-induced hyperthermia, while evaluating the results scientifically.

Based on the literature review and previous research results, some of the research gaps identified are: limitations in the disease context. Most Aloe vera compress studies have focused on generalized fever or post-immunization. In contrast, hyperthermia due to dengue in preschoolers has rarely been explicitly studied, mainly because of a lack of Nursing Implementation Studies. Previous research has focused more on the effects of temperature reduction. However, few have described the process of implementing nursing interventions, including therapeutic communication approaches and parental involvement, and have paid little attention to the child's individual responses. Variations in the child's response to therapy (e.g., cooperative level, psychological state, and initial temperature) have often not been

analyzed in depth. Existing studies are generally simple quantitative or single-case reports, so longitudinal clinical descriptions spanning several days of intervention remain rare. These gaps point to the need for research that not only measures effectiveness but also describes the implementation of Aloe vera therapy in real nursing practice, particularly in pediatric patients with dengue.

METHOD

This research used a comparative descriptive method with a case study approach. The subjects of the study were two pre-school children who experienced hyperthermia due to DHF at Arjawinangun Hospital. The intervention consisted of a compress (aloe vera) for 15 minutes. It is done 1x a day for 5 days to lower body temperature. To make an aloe vera compress, cut fresh aloe vera into 5 x 15 cm pieces, wash it thoroughly, and then peel it. The aloevera is then wrapped in sterile gauze before use. Data was collected through observation, interviews, and documentation.

DISCUSSION

Compress therapy (aloevera) was administered for five consecutive days. The process begins with preparing the necessary tools and materials, including thoroughly washing aloe vera. Therapy lasts 15 minutes, during which a compress is placed on the forehead. Subject 1 is a 5-year-old girl. Implementing therapy in children poses its own challenges because they are less cooperative. On the first day, the child appears restless and refuses to attend therapy. However, after an approach that involves parents and games to create a comfortable atmosphere, the child finally wants therapy. Over the following days, subject 1 became more cooperative, and the therapy process went more smoothly.

Subject 2 was a 5-year-old boy who had a fever. This child appears cooperative from the beginning of therapy, understands the instructions well, and shows no fear or rejection. On the first day of therapy, the child seemed calm and willing to do a compress (aloevera). The process of implementing therapy went smoothly for five consecutive days. Compress therapy (aloevera) was administered for five consecutive days. The process begins with preparing the necessary tools and materials, including thoroughly washing the aloe vera. Therapy lasts 15 minutes, during which a compress is placed on the forehead. Subject 1 is a 5-year-old girl. Implementing therapy in children poses its own challenges because they are less cooperative. On the first day, the child appears restless and refuses to attend therapy.

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Meanwhile, subject 2, a male, showed cooperative behavior on the first day and experienced a decrease in body temperature on the second day. In addition, the difference was observed in the initial fever levels of subjects 1 and 2. Subject 1 had a high fever from the beginning (39.8 °C), while subject 2 had a moderate fever (38.3 °C). Higher fever rates are likely to delay the onset of temperature drops.

The decrease in body temperature in the subjects indicates the success of non-pharmacological therapy with compresses (aloevera), which according to Maliah (2023) works on the principle of conduction, in which body heat is absorbed by Aloevera gel which contains about 95% water and has active compounds such as saponins and lignin that can penetrate the skin layer and send signals to the hypothalamus to regulate body temperature. This temperature drop is also supported by the results of the study With et al., (2023), Sari & Kusumaningrum, (2024) which suggests that compresses (aloevera) can lower the child's body temperature relatively quickly, with varying results depending on the child's response to therapy. The differences in responses between subjects 1 and 2 in this study indicated the influence of psychological factors and the child's level of cooperation. Subjects who are calmer and accept intervention well achieve faster, more optimal results. This is in line with the opinion Amelia & Princess, (2023) The effectiveness of the compress (aloevera) is related to the patient's initial temperature level and the individual's physiological condition.

Overall, the implementation of compress therapy (aloevera) has been proven to provide benefits not only physiologically in lowering body temperature, but also psychologically by improving the child's comfort during the treatment period. This

intervention is natural, safe, easy to implement, and can be carried out by health workers and families with the proper guidance.

Based on the research gap, the novelty of this article lies in several main aspects:

1. The specific focus is on preschoolers with hyperthermia due to dengue, rather than a general fever, making it relevant to high-risk clinical problems.
2. The descriptive-comparative approach is based on a case study, which describes the dynamics of a decrease in body temperature for five consecutive days, rather than just a momentary pre-post intervention.
3. Integration of nursing interventions with the psychological and behavioral aspects of the child, including the level of cooperation and parental involvement in the success of therapy.
4. The emphasis is on implementation according to nursing SOPs, so that the results of the research are not only scientific evidence, but also applicable to clinical nursing practice.

Placing Aloe vera as an alternative to nature-based complementary therapy that is safe, easy to apply in hospitals and at home with proper education.

With this novelty, this study makes a practical and conceptual contribution to the development of non-pharmacological-based pediatric nursing interventions in dengue cases.

CONCLUSION

Based on the results of the implementation of compress therapy (aloevera) in preschool-aged children with hyperthermia due to DHF, it can be concluded that this intervention has been proven to reduce body temperature. The two subjects in this study experienced a gradual decrease in body temperature after receiving an intervention for 5 days. In addition to lowering body temperature, this therapy also improves the child's comfort and emotional state during treatment. This study shows that compress therapy (aloevera) can be used as an alternative to non-pharmacological interventions that are safe, natural, and easy to apply.

SoA: Aloe vera is effective in reducing fever, but it has not been widely studied in preschoolers with dengue in the context of hospital nursing practice. Research Gap: Lack of implementive, dengue-specific, and longitudinal descriptive research. Novelty: A case study of the implementation of Aloe vera nursing in dengue children with an individualized response analysis and a holistic approach.

INVOLVEMENT

The implementation of aloe vera compress therapy in this case study has significant implications in various domains. Clinically, these findings support the integration of safe and natural non-pharmacological interventions into routine nursing care for pediatric patients with DHF-induced hyperthermia. These therapies can serve as companions or alternatives to pharmacological therapies, offering a simple, body-temperature-lowering option with minimal risk of side effects. Tested Standard Operating Procedures (SPOs) provide standard guidance for nurses. At the same time, therapeutic communication approaches and parental involvement, such as those proven to increase patient cooperativity, are key components for successful implementation in the care room.

In the context of education, the results of this study are valuable learning materials for nursing institutions. The case teaches students not only about procedural skills, but also about the variation in pediatric patient responses, the importance of individual approaches, and the application of evidence-based complementary therapies. Implications for families. Through adequate education, parents can be trained to apply aloe vera compress therapy independently at home as a first aid measure when a child has a fever, thereby increasing their participation in care and reducing anxiety.

However, the study also highlights the need for further research with a more robust design, such as experiments with control groups and larger samples, to validate the findings. The limitations in the study open up opportunities for deeper exploration of the effectiveness of aloe vera compresses compared to other media and their impact on parameters such as patient comfort. Holistically, the implications of this study reinforce the importance of innovative, nature-based, family-centered nursing approaches to improve the quality of pediatric patient care in managing infectious diseases such as DHF.

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