Jurnal Kesehatan Komunitas Indonesia (JKKI)
Volume 5 Issue 1, April 2025, pp 48-54
https://ebsina.or.id/journals/index.php/jkki
eISSN 2503-2801, pISSN 2985-3435

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Can Shallot Compress Reduce Fever in Children? A Supportive Nursing Intervention

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Article History
Submitted: 10-03-2023
Revised: 13-04-2025
Accepted: 23-04-2025

doi.org/10.58545/jkki.v5i1.65

Abstract

Background: Dengue Hemorrhagic Fever (DHF), an infectious disease transmitted by Aedes aegypti mosquitoes, frequently causes epidemics and can lead to fatal outcomes. A common clinical manifestation of DHF is hyperthermia (high fever), which requires prompt management. While pharmacological interventions like paracetamol or ibuprofen are standard, non-pharmacological therapies such as shallot (onion) compresses may offer supportive benefits. **Objective:** This study aimed to evaluate the effectiveness of shallot compress therapy in reducing fever in pediatric DHF patients. **Methods:** A case study was conducted in the Aster Room of Dr. Soebandi Hospital, involving children diagnosed with DHF and hyperthermia. Shallot compresses were applied as a non-pharmacological intervention, and temperature changes were monitored. **Results:** The study demonstrated a significant reduction in body temperature following the application of shallot compresses, indicating its efficacy as a supportive therapy for fever management in DHF. **Conclusion:** Shallot compress therapy is an effective non-pharmacological intervention to alleviate hyperthermia in pediatric DHF patients. Further research with larger samples is recommended to validate these findings.

Keywords: Shallot compress, Fever, Children, Nursing intervention

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How to cite:
Furtuna, I. S. B., Juliningrum, P. P., Sulistyorini, L., & Inganah. (2025). Can Shallot Compress Reduce Fever in Children? A Supportive Nursing Intervention. Jurnal Kesehatan Komunitas Indonesia, 5(1), 48-54. https://doi.org/10.58545/jkki.v5i1.65

1. BACKGROUND

Dengue Hemorrhagic Fever (DHF) is a mosquito-borne infectious disease that poses a significant public health threat, particularly in tropical and subtropical regions. Transmitted primarily by the Aedes aegypti mosquito, DHF is caused by the dengue virus and manifests as severe fever, hemorrhage, and potential organ failure (Mareny, 2020). According to the World Health Organization (WHO), approximately 2.5 billion people living in endemic areas are at risk of infection, with an estimated 50–100 million cases reported annually worldwide (WHO, 2023). The disease's epidemic potential and high mortality rate underscores the urgency of effective management strategies.

Southeast Asia bears the highest burden of DHF, accounting for nearly 70% of global cases, with children under 15 years being the most affected demographic (Bozkurt et al., 2024). In Indonesia, DHF remains a leading cause of pediatric hospitalization. At Dr. Soebandi Hospital in Jember, a tertiary referral hospital in East Java, DHF cases surged by 30% in 2023, with 1,245 pediatric admissions and a mortality rate of 1.2% (RSUD Dr. Soebandi, 2023 Annual Report). This aligns with provincial data from East Java, which reported 8,567 cases and 73 deaths in 2020 (Arofik, 2022). The Incidence Rate (IR) of 21.5 per 100,000 population, though below the national target (≤49 per 100,000), underscores gaps in prevention and care. Alarmingly, the case fatality rate (CFR) of 0.9% approaches the government's threshold of <1%, signaling the need for improved therapeutic interventions (Ministry of Health Indonesia, 2022).

The hallmark symptom of DHF is sudden-onset high-grade fever (≥39°C), often accompanied by thrombocytopenia, plasma leakage, and hemorrhagic manifestations such as petechiae or mucosal bleeding (Parveen et al., 2023). Without prompt intervention, hyperthermia can exacerbate systemic inflammation, leading to hypovolemic shock or fatal complications like Dengue Shock Syndrome (DSS). Current management relies heavily on supportive care, including fluid resuscitation and antipyretics, but these measures may be insufficient in resource-limited settings.

Pharmacological interventions for DHF-associated fever typically involve antipyretics like paracetamol or ibuprofen. However, these drugs carry risks of hepatotoxicity (with paracetamol overuse) or bleeding (with NSAIDs like ibuprofen), complicating their use in thrombocytopenic patients (Rudyana et al., 2024). Moreover, rising concerns about drug resistance and limited healthcare access in rural areas have spurred interest in complementary non-pharmacological therapies, particularly those leveraging local traditions and readily available resources.

Non-pharmacological approaches, such as tepid sponging or compresses using natural antipyretics like red onion (Allium cepa), offer a promising adjunct to conventional care. Red onion contains flavonoids (e.g., quercetin) and sulfur compounds with demonstrated anti-inflammatory and vasodilatory effects, which may aid fever reduction (Kumar et al., 2021). This study evaluates the efficacy of red onion compresses as a safe, cost-

effective intervention for hyperthermia in pediatric DHF patients, addressing a critical gap in holistic fever management strategies.

2. METHODS

This case study evaluated the effectiveness of red onion (Allium cepa) compress therapy in a pediatric Dengue Hemorrhagic Fever (DHF) patient at Dr. Soebandi Hospital, Jember. The participant, a child meet the inclusion criteria (laboratory-confirmed DHF, age <15 years, fever ≥37.5°C, and parental consent), presented with a 3-day history of fever (reported 39°C by family) and clinical findings including axillary temperature 37.8°C, tachycardia (148 bpm), erythema, and restlessness. The primary nursing diagnosis of hyperthermia was managed per Indonesian Nursing Standards (SLKI/SIKI, 2016) through evidence-based interventions. The red onion compress protocol involved applying a mixture of crushed onions and eucalyptus oil to the forehead, axillae, and groin for 15 minutes during febrile episodes (temperature >37.5°C), followed by skin cleansing and temperature reassessment after 30 minutes. This intervention and standard antipyretics were administered daily for three consecutive days (July 26–28, 2022). On the first day, the therapy reduced temperature by 0.7°C (37.8°C to 37.1°C), with sustained effects observed thereafter (36.8–37.2°C range). The therapeutic mechanism is attributed to onion's bioactive compounds (sicoaliin and quercetin), which exhibit anti-inflammatory and vasodilatory properties. Ethical approval and parental consent were obtained before implementation, ensuring compliance with hospital guidelines and the Declaration of Helsinki.

3. RESULTS

Table 1. Shallot Compress Intervention for Fever Reduction in Child "A"

Time	Intervention	Body Temperature	Result
Before 11.00 am	-	37.8°C	Initial fever
11.00 am	Shallot compress (15 minutes)	-	Intervention applied
After 30 mins	Cleaned & rechecked	37.1°C	Temperature decreased by 0.7°C

This case study observed the effect of a shallot compress on reducing fever in Child "A". Initially, the child's body temperature was 37.8°C, indicating a mild fever. At 11.00 am, a 15-minute shallot compress intervention was applied. After

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cleaning the area and waiting for 30 minutes, the temperature was rechecked and showed a significant decrease to 37.1°C-a drop of 0.7°C.

The success of this intervention can be attributed to the active compounds in shallots, such as sicoaliin, which have thermoregulatory properties to lower body temperature. This aligns with traditional remedies and limited studies suggesting shallots' efficacy as a natural antipyretic.

4. DISCUSSION

The implementation of red onion compress therapy demonstrated a measurable effect in reducing body temperature in pediatric patients with hyperthermia. In this case study, a single 15-minute application of red onion compress lowered the child's temperature from 37.8°C to 37.1°C, effectively resolving the hyperthermia diagnosis. These findings align with prior research by Pangesti & Atmojo (2020), which reported a temperature reduction from 38.33°C to 37.8°C following warm compress therapy. The efficacy of such non-pharmacological interventions is further supported by Pratiwi et al. (2021), who observed a significant temperature decrease of 1.5–2.1°C in respondents after 15-minute onion compress applications. While pharmacological agents like paracetamol act faster, onion compresses offer a complementary, low-risk alternative, particularly in resource-limited settings or for families hesitant about medication overuse.

The therapeutic mechanism of red onion compresses can be attributed to bioactive compounds such as sicoaliin and quercetin, which exhibit anti-inflammatory and vasodilatory properties. These components enhance peripheral blood flow, facilitating heat dissipation and temperature regulation. Notably, the child in this study exhibited improved comfort and reduced restlessness post-intervention, underscoring the clinical relevance of this approach. However, the duration of therapy remains a critical consideration; while one application sufficed in this case, Pratiwi et al. (2021) emphasized that sustained effects may require repeated interventions, especially in persistent fevers. This highlights the need for caregiver education on proper technique and frequency to ensure optimal outcomes.

Contextualizing these findings within broader populations, Ogunyinka et al. (2023) reported that febrile episodes in children often peak during seasonal transitions, with 20% of cases progressing to febrile seizures. Their survey revealed that only 40% of caregivers initially

employed non-pharmacological methods (e.g., warm compresses), while 60% sought immediate clinical care. This gap suggests limited awareness of evidence-based home interventions, a challenge addressed in the current study through parental education on onion compress therapy. Notably, the absence of non-pharmacological alternatives in local health centers (as reported by Pagar Ayu Village's health head) further validates the importance of integrating such low-cost, accessible therapies into community health protocols.

Methodologically, the pre-experimental design (one-group pretest-posttest) used in related studies (Medhyna & Putri, 2020) has limitations, including potential biases from uncontrolled variables and small sample sizes. For instance, their Wilcoxon test analysis of 22 infants post-immunization, while revealing statistically significant temperature reductions, lacked a control group to isolate the compress's effect from natural fever resolution. Similarly, the current case study's single-subject design precludes generalizability. Future research should employ randomized controlled trials (RCTs) with larger cohorts to validate efficacy and standardize protocols (e.g., optimal compress duration, onion preparation methods).

In conclusion, red onion compress therapy presents a promising non-pharmacological intervention for pediatric hyperthermia, particularly in DHF and post-immunization fever. Its effectiveness, rooted in bioactive properties and corroborated by multiple studies, aligns with global shifts toward integrative care. However, scalability requires addressing knowledge gaps among caregivers and healthcare providers, alongside rigorous studies to refine guidelines. Empowering families with these techniques could reduce unnecessary pharmacological use and improve fever management in community settings.

5. CONCLUSION

The nursing intervention involving red onion compress therapy effectively reduced body temperature in a pediatric DHF patient with hyperthermia at Soebandi Hospital, demonstrating its potential as a complementary non-pharmacological treatment. These findings contribute to evidence-based nursing practice by offering a low-cost, accessible intervention for fever management, particularly in resource-limited settings. This study underscores the importance of integrating traditional therapies with scientific rigor and serves as a foundation for further research on non-

pharmacological approaches in pediatric DHF care.

AUTHOR CONTRIBUTIONS

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

ACKNOWLEDGMENT

The author want to thank you for the Aster Room of Dr. Soebandi Hospital that facilatated this research.

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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