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Effectiveness of warm water compresses in lowering body temperature in children with febris

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ABSTRACT

Introduction: Febrile illness is a common clinical condition in children, often caused by viral or bacterial infections, and if not properly managed, can lead to serious complications such as seizures, dehydration, and altered consciousness. While pharmacological treatments like antipyretics are commonly used, non-pharmacological approaches like warm water compresses can be safe and effective alternatives. This study aimed to evaluate the effectiveness of warm water compresses in reducing body temperature in febrile children.

Methods: This descriptive case study involved two pediatric patients aged 1 and 3 years who were diagnosed with febris. Each child received warm water compress treatment twice daily for three consecutive days. The compress was applied to specific areas (forehead, armpits, and groin) for 15–20 minutes using a towel soaked in 37–40°C water. Body temperature was measured with a digital thermometer before and after each intervention session. Observations also included behavioural responses and parent interviews to assess comfort and satisfaction.

Results: The intervention demonstrated a significant decrease in body temperature among both patients. On average, there was a temperature reduction of 0.4°C to 1.0°C after each session, with a consistent downward trend over three days. Both children exhibited improved comfort and less irritability, and parents expressed satisfaction with the method as a supportive home care technique.

Conclusion: Warm water compresses are effective as a non-pharmacological intervention in lowering febrile temperature in children. The method is safe, simple, and well-accepted, making it a viable option in clinical and home settings. Healthcare providers and parents are encouraged to utilise warm compresses to respond to febrile episodes, reducing over-reliance on medications and promoting safe, supportive care practices for children.

Keywords: Children; Febris; Fever Management; Non-Pharmacological Intervention; Warm Compress

INTRODUCTION

Fever, or medically known as febris, is one of the most frequent symptoms that lead parents to seek medical attention for their children. While fever is not a disease, it often signals an underlying infection or inflammation within the body. In children, especially those under five years old, fever is a common and sometimes alarming occurrence [1]. This is because young children are in a critical development phase and possess immature immune systems, making them more vulnerable to various illnesses. As the body reacts to infection, whether caused by bacteria, viruses, or other pathogens, it increases its internal temperature as part of the immune defence mechanism [2]. However, if the fever is not correctly managed, it may result in complications such as febrile seizures, dehydration, or even disturbances in consciousness [3]. In Indonesia, particularly in regions such as Makassar, the prevalence of childhood fever remains high. The issue is further exacerbated by insufficient public awareness of effective home-based fever management techniques [4]. Although pharmaceutical interventions like paracetamol and ibuprofen are widely accessible and commonly used, there is growing concern about the overreliance on medications, especially in cases where non-drug interventions could provide safe and effective relief. This opens the door for reintroducing simple, non-pharmacological methods that can be administered safely at home or in primary healthcare settings. One such method is the application of warm water compresses [5].

A warm water compress is a technique involving the placement of cloths soaked in warm water (typically 37–40°C) on various parts of the body, such as the forehead, armpits, and groin. These areas are chosen because they contain large blood vessels close to the skin's surface, facilitating heat transfer [6]. This method promotes vasodilation, the widening of blood vessels, thereby enhancing the body's natural heat loss through the skin. This physical response allows for a gradual and safe reduction of body temperature [7]. Moreover, warm compresses provide a soothing and calming effect, which can help reduce discomfort and restlessness in children experiencing fever [8].

Despite the apparent benefits, using warm compresses as an initial fever management strategy is still underutilised, particularly in community settings. Many parents and caregivers are unaware of this option or unsure how to apply it effectively. Likewise, in some clinical environments, such interventions are often overlooked in favour of immediate pharmacological treatment. This situation highlights a significant gap in pediatric fever management practices and indicates the need for evidence-based advocacy for alternative or complementary therapies [9]. The present study was designed to address this gap by evaluating the effectiveness of warm water compresses in reducing body temperature among children with febris. Conducted in RSUP Dr. Tadjuddin Chalid Makassar, this research focused on children aged 1–5 years, a demographic known to experience high rates of fever [10]. Two pediatric patients were observed over three consecutive days, during which warm water compresses were applied twice daily. The compresses were carefully administered using a standardised technique, and body temperature was measured before and after each session using a digital thermometer to ensure accuracy [11]. The primary goal of this study was to assess whether the warm compress method could significantly reduce fever in children within a short period and to explore whether such a method could be recommended for broader use in both clinical and home-care settings [12]. By conducting this observational case study, we aimed to demonstrate that a simple, low-cost, and easily applicable intervention could have measurable effects on a child's comfort and physiological recovery from fever. In designing the research, care was taken to ensure that the approach would be replicable and ethically sound [13]. Parents were informed and gave their consent for their children to participate. The interventions were performed without antipyretic medication during the study period to maintain the integrity of the results. Observations extended beyond temperature measurement; changes in the child's behaviour, such as reduced irritability or increased calmness, were also documented. Interviews with parents were conducted to gather qualitative data on their perceptions of the intervention's effectiveness and practicality [14].

This study is not intended to replace standard medical treatments but rather to enrich the toolkit of both healthcare providers and caregivers when dealing with childhood fever. The research encourages greater adoption of evidence-based non-pharmacological interventions by highlighting the physiological mechanisms, practical application, and observed outcomes of warm water compress therapy.

Furthermore, it promotes empowering parents with accessible knowledge and skills to manage mild to moderate fever episodes at home, thus reducing unnecessary medical visits and drug consumption. In summary, this study was motivated by the urgent need for safer and simpler alternatives to fever management in young children. It sought to explore whether warm water compresses, a traditional yet often overlooked method, could offer a practical and comforting solution for pediatric patients. The findings of this study are expected to contribute meaningful insights into nursing practices and parental guidance, especially in communities where medical resources may be limited or health literacy remains a challenge.

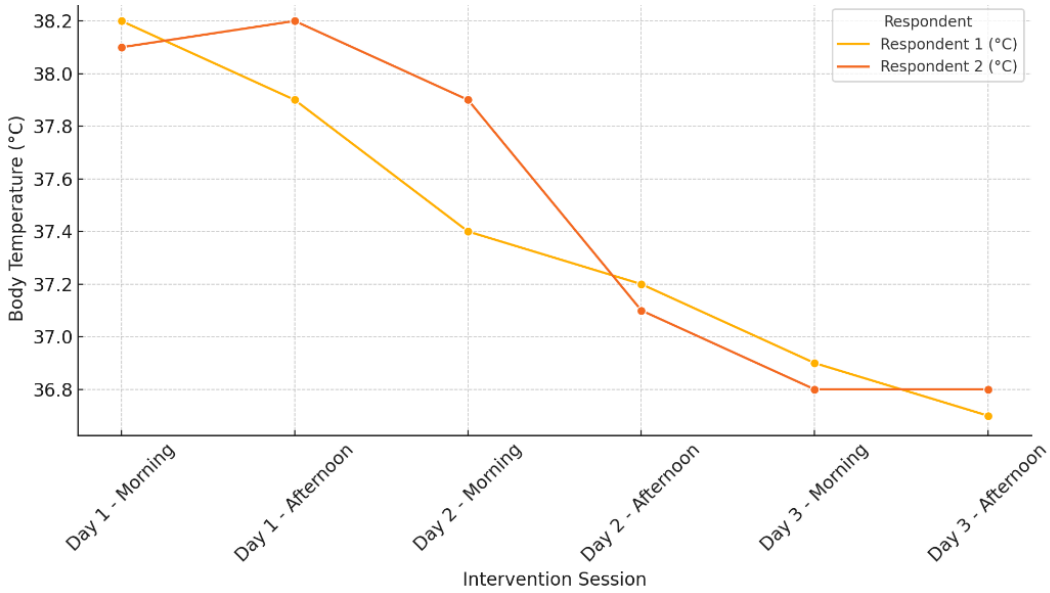
MATERIALS AND METHODS

This study employed a descriptive case study design to evaluate the effectiveness of warm water compresses in lowering body temperature among children diagnosed with febris. The research was conducted at RSUP Dr. Tadjuddin Chalid Makassar over one week, focusing on two pediatric patients who met the inclusion criteria. These criteria included children above 1 year with a confirmed diagnosis of febris and a body temperature exceeding 38°C. Children undergoing inpatient care at the hospital were selected, and those with complications or on antipyretic medication during the intervention period were excluded to maintain objective data. The intervention involved applying warm water compresses twice daily, once in the morning and once in the afternoon, for three consecutive days. Each session lasted between 15 and 20 minutes. The compresses were prepared by soaking clean towels in warm water at 37–40°C. These towels were then gently applied to key anatomical regions of large blood vessels: the forehead, axilla (armpits), and groin. This method was selected for its potential to facilitate heat dissipation through vasodilation and enhance thermal regulation.

Before and after each compress session, the child's body temperature was measured using a digital thermometer to ensure accurate and consistent monitoring. Additionally, subjective observations were made regarding the child's behaviour, including discomfort, restlessness, and general demeanour. To supplement quantitative findings, interviews were conducted with the children's parents or guardians using structured questionnaires. These interviews aimed to assess parental perceptions of the child's comfort, effectiveness of the compress method, and their satisfaction with the intervention. Instruments used in the study included: A digital thermometer for temperature measurement, Warm water at 37–40°C, Clean towels or washcloths, Observation sheets and informed consent forms, A structured interview questionnaire with rating scales from 1 to 10 assessing perceived effectiveness and comfort. Data analysis was conducted descriptively. Temperature differences before and after intervention were calculated to determine the efficacy of warm water compresses in reducing fever. Behavioural observations and interview responses were also summarised to provide a holistic understanding of the intervention's impact. Ethical considerations were observed throughout the study. Informed consent was obtained from each child's parent or guardian. Participant identities were anonymised to protect confidentiality. The research also upheld principles of voluntary participation, privacy, and non-maleficence.

RESULTS

This case study was conducted over one week in the Lily 4A pediatric ward of RSUP Dr. Tadjuddin Chalid Makassar. The study involved two pediatric respondents, a 1-year-old male and a 3-year-old female, both diagnosed with febris (fever) and admitted for inpatient care. The intervention used warm water compresses as a non-pharmacological method to reduce body temperature. Each respondent received warm compresses twice daily, in the morning and afternoon, for three consecutive days. Compresses were applied for 15 to 20 minutes to areas with large superficial blood vessels, namely the forehead, axilla, and groin, using towels soaked in water maintained at 37–40°C. The effectiveness of the intervention was assessed through digital body temperature measurements before and after each session.



Temperature Reduction. For Respondent 1 (male, 1 year old), the initial body temperature on Day 1 was 38.7°C. After the first and second compression sessions, the temperature decreased to 38.2°C and 37.9°C, respectively. On Day 2, the pre-intervention temperature was 37.8°C and declined further to 37.4°C in the morning and 37.2°C in the afternoon. On Day 3, the temperature decreased from 37.3°C to 36.9°C and finally to 36.7°C. This indicates an overall decrease of approximately 1.0°C over three days. For Respondent 2 (female, 3 years old), the initial temperature was 38.6°C. Post-intervention measurements on Day 1 showed reductions to 38.1°C and 38.2°C. On Day 2, the pre-intervention temperature was 38.1°C, followed by cuts to 37.9°C and 37.1°C. On Day 3, her body temperature decreased from 37.0°C to 36.8°C and remained stable at 36.8°C in the afternoon. The average decrease observed ranged from 0.4°C to 1.0°C per day: Behavioural Observations and Parent Feedback. In addition to the objective measurements, both children demonstrated observable improvements in behaviour after each session. They appeared less irritable, more relaxed, and exhibited signs of increased comfort. Parents reported greater satisfaction and decreased anxiety as they observed their child's fever subsiding through a simple, non-invasive intervention.

Interviews conducted with the parents indicated that they found the method practical and easy to implement, even in a home-care setting. According to a satisfaction rating scale (1–10), the perceived effectiveness ranged from 8 to 10, with both parents rating the intervention as highly effective and expressing willingness to use it again in future fever episodes. The warm water compress intervention resulted in a significant reduction in body temperature in both pediatric respondents. The pattern of decline was consistent across all three days of intervention, with average decreases of 0.6°C to 1.0°C observed after each session. The results suggest that warm compresses effectively support thermoregulation in febrile children and can serve as a complementary or initial response before pharmacological treatments are administered.

DISCUSSION

The present study explored the effectiveness of warm water compresses in reducing body temperature among pediatric patients diagnosed with febris (fever). The results demonstrated a consistent decline in body temperature in both respondents across a three-day intervention period, with temperature reductions ranging from 0.4°C to 1.0°C after each session. These findings highlight the potential of warm compresses as a simple, non-pharmacological intervention for fever management in children. Fever is one of the most common clinical symptoms in pediatric healthcare. It often triggers concern among caregivers, prompting them to seek immediate medical attention. Although fever is a natural physiological response that enhances the body's immune defence, particularly by inhibiting

pathogen replication and improving immune cell activity, it must be managed when it reaches levels that may cause discomfort or complications.

A fever exceeding 38.5°C in young children can lead to febrile seizures, dehydration, irritability, and impaired feeding and sleep patterns. Therefore, managing fever safely and effectively remains a key component of pediatric care. In this study, both respondents had initial temperatures above 38.5°C, qualifying them for febrile intervention. Through the application of warm compresses twice daily for three consecutive days, both children exhibited consistent decreases in temperature. Respondent 1, a 1-year-old male, experienced a decline from 38.7°C to 36.7°C, while Respondent 2, a 3-year-old female, saw a reduction from 38.6°C to 36.8°C. These outcomes suggest that warm compresses can facilitate a gradual, safe decrease in body temperature, minimising risks associated with high fever [15].

The physiological mechanism underlying this intervention is primarily driven by vasodilation. When a warm compress is applied to regions rich in blood vessels, such as the forehead, axilla, and groin, blood flow to the skin surface increases [16]. This promotes heat dissipation through conduction, convection, and evaporation. As a result, the core body temperature decreases without needing pharmacological agents. Unlike antipyretics, which act on the hypothalamic thermoregulatory centre, warm compresses offer a peripheral approach by targeting surface-level thermoregulation. These findings are consistent with existing literature [17].

Previous studies have confirmed that warm or tepid sponge baths can significantly reduce fever in children within minutes to hours after application. That tepid sponge baths using 37°C water markedly reduced pediatric body temperature [18]. Demonstrated that compresses applied to vascular areas, such as the axilla, were particularly effective due to proximity to the hypothalamus and the dense presence of thermoreceptors. Both respondents tolerated the intervention well in this study, with no reported adverse effects. Parental feedback indicated that the children appeared more comfortable, with reduced irritability and improved mood following each session [19]. This aligns with anecdotal clinical observations that non-invasive and comforting interventions can enhance pediatric patients' physiological and psychological well-being. Parents rated the intervention as highly satisfactory, with scores between 8 and 10 on a 10-point effectiveness scale. This suggests a strong acceptance of the method as part of home-care practices.

The study's findings support using warm compresses as an adjunct to pharmacological treatments and as an initial standalone strategy in mild to moderate fever cases. Particularly in low-resource settings or among parents hesitant to use medications frequently, warm compresses provide a viable, evidence-based alternative [20]. They are low-cost, easy to administer, and do not require specialised equipment, making them especially valuable in rural or underserved areas. Nonetheless, some limitations must be acknowledged. First, this study involved only two respondents, and the case study design does not allow for generalisation to larger populations [21]. Future research should consider randomised controlled trials with larger sample sizes to validate the findings more robustly. Second, although efforts were made to standardise the temperature and duration of compress application, individual variations in heat loss, hydration status, and underlying illness may have influenced the outcomes [22]. Furthermore, the absence of a control group receiving no intervention or a different intervention (e.g., pharmacological treatment alone) limits the ability to compare the relative efficacy of warm compresses.

Another consideration is the role of age and physiological development in fever response. Younger children, such as Respondent 1, may be more susceptible to fever due to an immature immune system and less developed thermoregulation mechanisms. Interestingly, both respondents responded positively to the intervention, suggesting that warm compresses may be universally beneficial across early childhood age ranges. However, more detailed investigations are needed to assess whether age, body mass index, or illness severity moderate the effect of compresses. The study also did not measure biochemical markers such as cytokine levels or inflammatory markers, which could provide deeper insight into the biological impact of temperature regulation through non-pharmacological methods. Future research may integrate such biomarkers to explore whether warm compresses influence inflammatory pathways, beyond simply reducing surface temperature. Despite these limitations, the practical implications of this study are significant. Healthcare providers, particularly nurses and community health workers, can be trained to educate caregivers about proper fever management techniques, including the correct use of warm compresses. Health education sessions can emphasise the

benefits of early fever intervention, the importance of hydration, and signs requiring medical care escalation. Healthcare systems can reduce unnecessary emergency visits and optimise resource utilisation by promoting simple interventions like warm compresses.

Moreover, integrating warm compresses into standard pediatric care protocols—especially in outpatient and emergency triage settings may enhance patient outcomes and parental satisfaction. Combined with clinical monitoring and pharmacological treatments when necessary, warm compresses offer a holistic, child-friendly approach to fever management. In conclusion, this study demonstrates that warm water compresses are a safe, effective, and well-tolerated method for reducing body temperature in febrile children. The intervention showed measurable success in both subjects, with consistent temperature reduction observed over three days. While further research is required to confirm these results on a larger scale, the findings support the integration of warm compresses into both clinical practice and home care. This method empowers parents and caregivers to take immediate, non-invasive action when managing a child's fever, contributing to better pediatric health outcomes.

CONCLUSIONS

This study concluded that applying warm water compresses is an effective non-pharmacological intervention for reducing body temperature in children diagnosed with febris. The intervention, applied consistently over three consecutive days, resulted in a significant and gradual decline in body temperature in both pediatric respondents. Each session led to a temperature reduction ranging from 0.4°C to 1.0°C, markedly improving the children's overall comfort and behaviour. Warm compress therapy demonstrated physiological benefits and high acceptance from caregivers, who reported satisfaction and increased confidence in managing fever at home. These results reinforce the value of warm compresses as a safe, simple, and low-cost method that can be used independently or as a complementary measure alongside pharmacological treatments. The findings support the integration of warm compress techniques into standard pediatric nursing care and health education for parents. Promoting such methods can reduce reliance on antipyretic medications, lower the risk of associated side effects, and improve the quality of care provided to febrile children in both clinical and home settings. In essence, warm water compresses offer an accessible and practical approach to fever management, particularly in settings with limited medical resources.

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Authors' contributions

All authors contributed significantly to the development and completion of this research study.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this research. No financial, professional, or personal relationships have influenced the outcomes or interpretations presented in this study.

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