Indonesian Journal of Nursing and Health Sciences
Volume 6 Nomor 2, Oktober 2025
p-ISSN 2746-5497; e-ISSN 2746-5500
http://jurnal.globalhealthsciencegroup.com/index.php/IJNHS

EFFECTIVENESS OF GIVING WARM COMPRESS TO THE ABDOMEN WALL AREA AND MAJOR VEIN AREA ON REDUCING BODY TEMPERATURE

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ABSTRACT
Fever is a common clinical condition in pediatric patients and requires appropriate management to ensure comfort and prevent complications. Warm compress therapy is a non-pharmacological nursing intervention that supports thermoregulation by promoting peripheral vasodilation and enhancing heat dissipation. This study reviews the physiological basis, clinical application, and effectiveness of warm compresses in reducing fever among children. Evidence from previous studies indicates that warm compress therapy can moderately reduce body temperature, increase patient comfort, and decrease reliance on antipyretic medications. Data collection followed several preparatory steps, including a preliminary survey, development of measurement instruments, submission of the research proposal, and obtaining ethical and institutional approval. During data collection, researchers ensured that all participants received standardized instructions and identical warm compress procedures to maintain intervention consistency. The study generated interval-scale body temperature data, which were analyzed using both univariate and bivariate statistical methods. The findings highlight the importance of integrating warm compresses into routine pediatric nursing care as a safe and accessible intervention that strengthens non-pharmacological fever management strategies.

Keywords: non-pharmacological therapy; nursing intervention; pediatric fever; thermoregulation; warm compress

INTRODUCTION
Nursing interventions represent a fundamental component of the nursing care process, reflecting the clinical competence, ethical responsibility, and professional autonomy of nurses. (Nordaunet, Gjevjon, Aagaard, Olsson, & Borglin, 2025). These interventions include both independent and collaborative actions such as planning and implementing nursing care, providing referrals, performing emergency measures, offering health consultations and education, engaging in multidisciplinary collaboration, administering medications within the scope of practice, managing cases, and applying complementary and alternative therapies (Wahyuni et al., 2024). These roles are clearly regulated under Article 30 of the Indonesian Nursing Act No. 38 of 2014, emphasizing that nurses contribute not only to curative care but also to promotive, preventive, and rehabilitative efforts (Wirentanus, 2019). Among the wide range of nursing interventions, non-pharmacological therapies are gaining increased attention due to their proven effectiveness, safety profile, and supportive role in patient recovery.

One of the most widely used non-pharmacological interventions in clinical nursing practice is the application of compress therapy (Toto & Nababan, 2023). Both warm and cold compresses have long been utilized to elicit physiological responses that aid the healing process (Yao et al., 2024). Warm compresses help increase blood flow, enhance tissue metabolism, promote muscle relaxation, and facilitate heat dissipation, while cold compresses are beneficial in reducing inflammation, slowing cellular metabolism, and alleviating pain in acute injuries (Hannan, Suprayitno, & Yuliyana, 2019; Wang & Ni, 2021). Common forms of compress therapy include warm wet compresses, warm dry compresses using hot water bottles, cold wet compresses with antiseptic solutions or plain water, and cold dry compresses using ice packs (Wati, Dewi, & Pakarti, 2023). The effectiveness of compress therapy has been supported by various nursing

studies, particularly in managing fever in children (Souza et al., 2022).
Fever is defined as an elevation of body temperature above normal due to an increase in the hypothalamic thermoregulatory set point (Meirita, Pangestu, & Rindu, 2024). In children, fever is one of the most frequent symptoms leading parents to seek medical care, as it may cause discomfort, dehydration, and in certain age groups febrile seizures (Alsofyani & Hassanien, 2022). Physiologically, fever results from the activity of endogenous pyrogens such as interleukin-1, interleukin-6, and TNF-α, which influence thermoregulation at the hypothalamic level. Although fever has a protective immune function by enhancing both specific and non-specific immune responses, appropriate management is required to maintain physiological stability and ensure comfort in pediatric patients (El-Radhi, 2018). Warm compress therapy is considered an effective non-pharmacological measure for reducing fever in children due to its clear physiological mechanism (Rohmahwati & Khayati, 2024). When applied to areas such as the axillae or groin, warm compresses increase skin temperature, prompting peripheral vasodilation, improved heat conduction, and enhanced heat loss through the skin (Syamsuddin & Pakaya, 2021). The body interprets this external warmth as an elevation in environmental temperature, resulting in a downward adjustment of the hypothalamic set point. This process causes dilation of peripheral blood vessels, opening of skin pores, and facilitated evaporation, ultimately leading to a gradual reduction in body temperature (Kuht & Farmery, 2021).

Previous research provides strong support for the use of warm compresses in pediatric fever management (Sumakul & Lariwu, 2022; Wulandari & Nuriman, 2022). Clinical studies have shown that warm compresses can reduce body temperature within 15–30 minutes of application and maintain a stable effect when combined with adequate hydration or other supportive measures (Souza et al., 2022). Comparative studies by Wardiyah, Setiawati, & Dwi (2016) indicate that while antipyretics may reduce temperature more rapidly, warm compresses offer a safer and gentler temperature-lowering effect, making them particularly advantageous for children who are sensitive to medications (Rahmawati & Purwanto, 2020). Community-based nursing research has also reported that parent education on warm compress techniques increases caregiver competence in managing fever at home and reduces unnecessary healthcare visits for mild febrile conditions. These findings underscore the clinical value of warm compress therapy as an accessible, low-risk intervention that enhances pediatric comfort and supports effective fever management (Yeni, Sari, & Sitorus, 2025). Given its strong physiological basis, empirical support, safety, and ease of implementation, warm compress therapy serves as an important nursing strategy in the management of fever among children. This intervention not only enhances patient comfort but also reduces the potential overuse of pharmacological antipyretics, thus contributing to improved quality of nursing care and optimizing pediatric patient The study aimed to compare the effectiveness of warm compress application over a major venous area (axilla) and the abdominal wall in reducing pediatric fever.

METODE

This study employed a quasi-experimental design using a pre-test and post-test approach. The design was selected to allow comparison of body temperature changes before and after the intervention in two different treatment groups. Each participant underwent baseline body temperature measurement (pre-test) prior to the application of the warm compress intervention and a follow-up measurement (post-test) immediately after the intervention. The study aimed to compare the effectiveness of warm compress application over a major venous area (axilla) and the abdominal wall in reducing pediatric fever. The study sample consisted of RSUD Besuki's pediatric patients and their caregivers who met the inclusion criteria, including: (1) the ability to read, write, and communicate effectively, and (2) willingness to participate as research respondents. Eligible participants who fulfilled the inclusion criteria underwent an initial observation assessing their fever history and any antipyretic medications previously administered. Participants were then assigned into two groups: (1) the abdominal-wall

compress group and (2) the major-venous-area (axillary) compress group. Both groups underwent initial body temperature measurement using a standardized thermometer. The interventions were performed by applying a warm compress for 15–20 minutes to the designated anatomical area either the right upper abdominal region or the axillary venous region. Post-intervention body temperature measurements were then collected using the same thermometer and measurement technique to ensure consistency. All findings from pre-test and post-test measurements were systematically recorded in an observation sheet. Data collection followed several preparatory steps, including a preliminary survey, development of measurement instruments, submission of the research proposal, and obtaining ethical and institutional approval. During data collection, researchers ensured that all participants received standardized instructions and identical warm compress procedures to maintain intervention consistency.

The study generated interval-scale body temperature data, which were analyzed using both univariate and bivariate statistical methods. Univariate analysis was performed to describe participant characteristics and baseline temperature distributions. Bivariate analysis utilized an independent samples t-test to compare the mean temperature reduction between the two intervention groups. Additionally, a paired t-test was employed to examine pre-test and post-test temperature differences within each group. A significance level of $p \leq 0.05$ was adopted to determine whether differences between groups and within groups were statistically meaningful. The research adhered to standard ethical principles, including informed consent, anonymity, and confidentiality. Participants and caregivers were provided clear explanations regarding the study purpose, procedures, potential risks, and their rights to withdraw at any time. All data were coded to ensure participant identity remained confidential throughout data management and reporting.

RESULTS AND DISCUSSION

The results of this study were obtained from two groups of respondents at RSUD Besuki: one group receiving compression on the major vein (armpit) and the other group receiving compression on the abdominal wall, each receiving intervention for 15–20 minutes. Prior to the intervention, all participants underwent an initial observation phase to ensure compliance with the inclusion criteria and to assess their history of fever and previous use of antipyretic drugs. Pre-test body temperature measurements showed that both groups were within a relatively similar fever range, making them suitable for statistical comparison. Descriptively, after the compression intervention, both groups showed a decrease in body temperature, but the magnitude of the decrease appeared to be different. The group that received compression on the major vein area (armpit) tended to show a faster and greater decrease in temperature than the abdominal wall compression group. This is evident from the average temperature difference between the pre-test and post-test which was higher in the major vein group. The results of the analysis using a paired t-test in each group showed that the compression intervention had a significant effect on reducing body temperature ($p \leq 0.05$). When the two groups were compared using an independent sample t-test, it was found that the temperature decrease in the major vein compression group was statistically more significant than the abdominal wall compression group ($p \leq 0.05$).

These results are consistent with the physiological principle that the armpit area is a location rich in large blood vessels, especially the axillary vein, so that the effect of heat transfer through the conduction mechanism becomes more effective (Cahyaningrum, Amal, & Sulistyaningsih, 2025). Thus, the decrease in body temperature occurs more quickly than compressing the abdominal wall, where superficial blood flow is not as great as in the armpit area (de Virgilio, 2015). In addition, the armpit is also a closed area that easily maintains the temperature of the compress so that the heat absorption process takes place more stably (Chen, Zhu, Lin, & Liu,

2022).

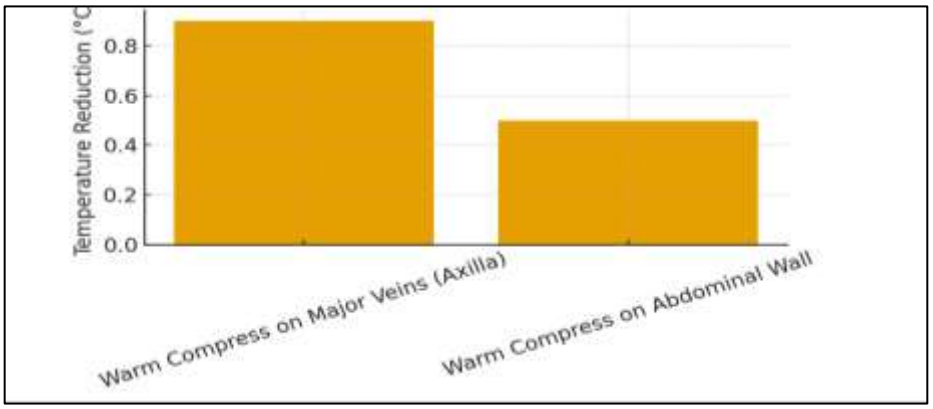

Figure 1. Comparison Temperature Reduction by Compress Location

The findings of this study are in line with various previous studies which reported that compresses in areas with large blood flow such as the armpits, groin, and neck are more effective in reducing body temperature due to their proximity to large blood vessels and the high heat conductivity in these areas (Arafah, Dewiyanti, Kamriana, Ernawati, & Alwii, 2024; Marlina, Immawati, & Nurhayati, 2023; Sorena, Slamet, & Sihombing, 2019). Other studies by Baek, Cheon, Lim, Yu, & Heo (2024) Rahmawati & Purwanto (2020) on warm and cold compress techniques on vascular areas showed similar results, namely a faster temperature reduction response compared to applying compresses to areas with thicker fatty tissue, such as the abdomen. These supporting findings strengthen the assumption that the effectiveness of compression is greatly influenced by the anatomical characteristics of the area where the intervention is given.

In addition to the location of the compress, the success of fever reduction in this study was also supported by the consistent duration of compress application, namely 15–20 minutes, which is in accordance with recommendations from several studies on non-pharmacological management of fever (Akbar, Arfan, Suprapto, & Mariska, 2025; Souza et al., 2022). Observations made immediately after the intervention helped ensure that the recorded temperature changes were truly the effect of the compress, and not other factors such as patient activity or environmental changes. Overall, the results of this study indicate that compresses applied to the major vein area (armpit) are more effective in reducing body temperature in patients at RSUD Besuki than compresses applied to the abdominal wall. This effectiveness is evident not only from the greater temperature changes but also from the statistical significance supporting the difference between groups. Thus, this study provides a strong scientific basis for clinical practice, particularly in selecting the most optimal compression method for patients with fever. These findings can be used as a reference for improving nursing care standards, particularly in non-pharmacological interventions for fever control.

CONCLUSION

This study demonstrates that warm compress therapy is effective in reducing fever among pediatric patients at RSUD Besuki. Both techniques—warm compresses applied to the major veins (axilla) and to the abdominal wall—resulted in significant decreases in body temperature following the intervention. However, warm compresses applied to the major veins in the axillary region proved to be more effective than those applied to the abdominal wall, both clinically and statistically. The greater reduction in temperature observed in the axillary group is attributed to the anatomical characteristics of this area, which contains major blood vessels that facilitate more efficient heat transfer through conduction and evaporation. These findings are consistent with previous studies showing that compresses applied to highly vascularized

regions yield stronger antipyretic effects. Overall, this study confirms that warm compresses applied to the axillary region can be recommended as a safe, simple, low-cost, and effective non-pharmacological nursing intervention for managing fever in children. The findings provide a scientific basis for nursing practice, support family education on fever management, and may guide healthcare institutions in developing standard operating procedures for non-pharmacological fever reduction strategies.

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