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The Effect of Giving Warm Compress Using Hotpack on Increasing Body Temperature in Post-Operative Patients with Hypothermia in the Recovery Room

Fadli Syamsuddin[1], Nurlia[1], Romdon Purwanto[1], Nur'Ain Mooduto[1]

[1]*Program Studi Profesi Ners, Fakultas Kedokteran dan Ilmu Kesehatan, Universitas Muhammadiyah Gorontalo*

**Corresponding Author: Fadli Syamsuddin*
E-mail: ainmooduto04@gmail.com

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Abstract

One of the complications that arise after anaesthesia is hypothermia. Induction of general anaesthesia will cause vasodilation. Measures to prevent hypothermia can be done with a non-pharmacological approach called the rewarming method. in this study, namely to determine whether there is an effect of giving warm compresses using hot packs on increasing body temperature in postoperative patients with hypothermia in the Recovery Room (RR) of Prof. Dr. Aloeisaboe Hospital, Gorontalo City. used in this research is quantitative research using this research design is Pre-experimental with a one-group pre-post test design approach, the number of samples in this study is the same as the population of 10 respondents. The results showed that there was an effect of giving warm compresses using hot packs on increasing body temperature in postoperative patients with hypothermia in the Recovery Room (RR) of Prof. Dr. H. Aloei Saboe Hospital Gorontalo City with a P-Velue of 0.000 (α < 0.005). It is hoped that it can add information about giving warm compresses using hot packs to increase body temperature in postoperative patients with hypothermia and participate in providing nursing actions for giving hot packs to patients experiencing postoperative hypothermia in accordance with the SOP.

Introduction

Surgery or operation is an invasive medical treatment intended to diagnose or treat diseases, injuries, or abnormalities in the body that will damage tissue that can cause physiological changes in the patient and also affect other organs of the body, the aim is to open the tissue. Before the operation is carried out, efforts are needed to eliminate pain and consciousness in the patient, also known as anesthesia (Febriani et al., 2020; Ghoneim et al., 2009; Liu & Larson, 2022).

Based on data from the World Health Organization (WHO), the number of surgical procedures recorded from all hospitals in the world in 2016 reached 148 million people. This number is also an increase from the previous year. Meanwhile, data from the Indonesian Ministry of Health shows that the percentage of surgical procedures in all hospitals in Indonesia reached 12.8% in 2018. Patients before undergoing surgical procedures are always given anesthesia where this anesthesia can have an impact on the patient's body thermoregulation so that surgical patients can experience hypothermia (Firdaus et al., 2022; Salgado et al., 2023; Ahmed et al., 2024; Motamed et al., 2024).

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The post-anesthesia recovery period is known as a high-risk time for complications. One of the complications that arise after anesthesia is hypothermia (Dias et al., 2022). Induction of general anesthesia will cause vasodilation. This occurs through two mechanisms, namely anesthetic drugs directly cause vasodilation of blood vessels and general anesthesia reduces the threshold value of vasoconstriction by inhibiting the function of central thermoregulation. (Sari et al., 2022) Hypothermia is a condition of body temperature below 36.5 ℃ when measured through the armpit (Depkes, 2009). Some causes of hypothermia in the operating room are cold operating room temperatures, use of disinfectants, infusion fluids and blood transfusions, cavity cleaning fluids in the surgical area, patient conditions (age), and use of anesthetic drugs (Pringgayuda & Putra, 2020). Perioperative hypothermia can cause many complications including heart defects, impaired wound healing, increased surgical site infections, shivering and delayed postoperative recovery, increased ICU stays, length of hospital stays and coagulopathy. Untreated hypothermia cases can have adverse effects on patients, such as prolonging the action of anesthetic drugs, disrupting coagulation and platelet function, increasing blood loss and the need for transfusions, increasing wound infections, prolonging hospital stays, causing discomfort and postoperative shivering, increased oxygen consumption, heart rate, blood pressure, and plasma catecholamine levels (Yulianita et al., 2023; Simegn et al., 2021; Ruetzler et al., 2025; Hernández-Avalos et al., 2021).

Postoperative hypothermia is a state of body temperature below normal temperature (<36°C). The process of losing body temperature due to surgery where there is an excessive increase in body metabolism and results in vasoconstriction and changes in thermoregulation of the system in the hypothalamus (Prastio, 2023). Restoration of body heat must be done immediately because the next effect is that the patient will experience other discomfort, namely Shivering (shivering) plus postoperative pain that will be experienced by the patient. The effects of hypothermia can also slow down healing, affecting the length of postoperative care. And affects the length of postoperative care (Susatia, 2020).

Actions to prevent hypothermia can be done with a non-pharmacological approach called the rewarming method (rewarming techniques) which consists of 3 parts, namely passive external, active external, and active internal. One of the warming with heat conduction is by using warm compress therapy (Baraka et al., 2020; Radzikowska-B et al., 2023). Hot-pack is a closed package whose temperature is raised to hot or according to the temperature that the patient can withstand. Hot-pack is used as a substitute for hot flasks as a tool to restore body temperature, besides being more practical, Hot-pack does not need to be refilled like using a flask whose water must be replaced if the temperature has changed, and filling hot water into the flask can spill and cause the patient to get wet if it drips (Susatia, 2020) According to research (Sari et al., 2022) the average body temperature of 30 respondents before being given a hotpack was 35.5 - 35.7 ℃ and the average body temperature of 30 respondents after being given a hotpack increased to 36 ℃. This proves that there is an effect of giving a hotpack on increasing body temperature in patients with hypothermia after general anesthesia. The study (Apriliana, 2023) showed the average body temperature of respondents before the intervention was 36.16°C or in the range of 36°C-37°C, the operating room temperature was 20.84°C, and all 16 respondents (100%) had body temperatures in the normal range of 36°C-37°C. there is an influence in the administration of hot packs on patients with spinal anesthesia who experience hypothermia at IBS RSI Sultan Agung Semarang. The use of hot packs can restore body temperature quickly based on the results of previous studies, by being given a hot pack there is a sensation and effect of heat transmitted through the skin and received by the dermal nerves which widen causing blood flow to spread and the body gets adequate flow and causes the temperature around the skin surface to increase. The body responds to heat by causing blood vessels to dilate, reducing blood viscosity, reducing muscle tension and increasing tissue metabolism and increasing capillary permeability. (Mukarromah & Wulandari, 2019) Based on the description above, the author is interested in creating a Scientific Paper entitled "The

Effect of Giving Warm Compresses Using Hotpacks on Increasing Body Temperature in Postoperative Patients with Hypothermia in the Recovery Room (RR) of Prof. Dr. Aloeisaboe Hospital, Gorontalo City".

Methods

The research method used in this study is quantitative research using this research design is Pre-experimental with a one-group pre-post test design approach, Observations were made before and after the subject was given intervention. In this study, post-operative patients with hypothermia were observed initially (pre-test) the patient's body temperature, then given a warm compress intervention with a hot pack. After the intervention was carried out, the patient's body temperature was re-observed (post-test). The population in this study were post-operative patients in the recovery room (RR) of Prof. Dr. Aloei Saboe Hospital, Gorontalo City, as many as 10 patients, so that the number of samples in this study was the same as the population, namely 10 respondents. In this study, sample selection was carried out by total sampling. The data collection technique in this study was primary data in this study were the results of researcher observations and documentation studies, while the source of secondary data in this study was data from Aloei Saboe Hospital, Gorontalo City. The types of instruments used in this study were observation sheets to observe the results of respondents' body temperature before and after the intervention and standard operating procedure (SOP) sheets for providing warm compress therapy.

The data analysis technique in this study was univariate analysis related to frequency distribution, the highest frequency value, minimum and maximum values from the results of body temperature observations before and after being given a warm compress and bivariate analysis using the paired t-test with a decision value limit of $<\alpha$ 0.05.

Result and Discussion

Table 1. Body temperature of patients pre-intervention test

Body Temperature	Frequency	Percentage
35℃ - 35,5℃	0	0
35,6℃ - 36℃	7	70
36,1℃ - 36,5℃	3	30
36,6℃ - 37℃	0	0
Total	**10**	**100**

Source: Primary Data 2024

Based on the table above, it shows that the body temperature before being given a warm compress using a hotpack was 35.6℃ - 36℃ for 7 respondents (70%) and 3 respondents (30%) had a body temperature of 36.1℃ - 36.5℃.

Table 2. Body temperature of post-intervention test patients

Body Temperature	Frequency	Percentage
35℃ - 35,5℃	0	0
35,6℃ - 36℃	0	0
36,1℃ - 36,5℃	4	40
36,6℃ - 37℃	6	60
Total	**10**	**100**

Source: Primary Data 2024

Based on the table above, it shows that the body temperature after being given a warm compress using a hotpack is with a body temperature of 36.1℃ - 36.5℃ for 4 respondents (40%) and with a body temperature of 36.6℃ - 37℃ for 6 respondents (60%).

Table 3. Bivariate Analysis of Giving Warm Compresses Using Hotpacks on Increasing Body Temperature of Post-Operative Patients with Hypothermia in the Recovery Room (RR) of Prof. Dr. Aloei Saboe Hospital

Body Temperature	N	Mean	St. Devitiation	*t*	*P-value*
Pretest-Posttest	10	-0.6700	0.1251	-16.927	**0.000**

Source: Primary Data 2024

Based on the table above, it shows that the results of the Paired Sample t-Test obtained an average value of -0.6700 with a standard deviation of 0.1251 with a t value of -16.927 and a P-Value of 0.000 <0.005, it can be concluded that there is an effect of giving warm compresses using hotpacks on increasing the body temperature of post-operative patients with hypothermia in the Recovery Room (RR) of Prof. Dr. Aloei Saboe Hospital, Gorontalo City.

The results of this study indicate that the body temperature before being given a warm compress using a hotpack was 35.6℃ - 36℃ for 7 respondents (70%) and 3 respondents (30%) had a body temperature of 36.1℃ - 36.5℃. In this case, it shows that the body temperature of the respondents before being given a warm compress using a hotpack was mostly in the range of 35.6℃ - 36℃ which is included in mild hypothermia. In this study, the average length of surgery was more than 3 hours. After being given a warm compress using a hotpack, the body temperature was 36.1℃ - 36.5℃ for 4 respondents (40%) and the body temperature was 36.6℃ - 37℃ for 6 respondents (60%). These results indicate that there was an increase in body temperature after being given a warm compress using a hotpack where most respondents had a body temperature ranging between 36.6℃ - 37℃. The results of this study indicate that the results of the Paired Sample t-Test obtained an average value of -1.300 with a standard deviation of 0.483 with a t value of -8.510 and a P-Value of 0.000 <0.005, it can be concluded that there is an effect of giving warm compresses using hotpacks on increasing the body temperature of post-operative patients with hypothermia in the Recovery Room (RR) of Prof. Dr. Aloei Saboe Hospital, Gorontalo City.

According to Susatia (2020) the use of hotpacks as warm compresses to be given to patients is more practical, which is a closed package whose temperature is increased to hot or according to the temperature that the patient can withstand. Hotpacks are used as a substitute for flasks as a return to body temperature, hotpacks do not need to be refilled like using flasks whose water must be replaced if the temperature has changed.

According to Yasin (2014) quoted by Sari et al. (2022) said physiologically, the body's response to heat is to cause blood vessel dilation, reduce blood viscosity, reduce muscle tension, increase tissue metabolism and increase capillary permeability. This heat response is used for therapeutic purposes in various conditions and circumstances that occur in the body. In addition, the body can respond well to low temperature adjustments. According to the theory of Guyton & Hall (2014) quoted by Apriliana (2023) the mechanism of increasing body temperature when the body is too cold, the temperature regulation system, namely the hypothalamus, carries out the exact opposite procedure, namely vasoconstriction of the skin throughout the body caused by stimulation from the posterior hypothalamic sympathetic nerve center, piloerection, namely sympathetic stimulation causes the arrector pili muscles attached to the hair follicles to contribute to hair standing upright and increased thermogenesis (heat formation), namely the formation of heat by the increased metabolic system, triggering shivering, sympathetic stimulation for heat formation and thyroxine secretion.

Based on research conducted by Mukarromah & Wulandari (2019) the provision of warm therapy to reduce the intensity of shivering is influenced by the mechanism of increasing body temperature, namely the effect of hypothalamic temperature on the release of body heat through evaporation. Evaporation is a process that requires the evaporation of heat absorbed from the

skin. Evaporation from the skin or lungs that is not visible cannot be controlled for the purpose of regulating temperature because the evaporation is produced from the continuous diffusion of water molecules through the surface of the skin and the respiratory system. Body temperature returns to normal range after giving warm compress therapy using a hotpack which causes the heat effect to react to the skin preceptor which functions as a regulator of body temperature both to heat and cold temperatures. This is in line with research conducted by Sari et al. (2022) at the PKU Muhammadiyah Hospital in Yogyakarta where there was a significant increase in body temperature in respondents after being given a hotpack. Where the average body temperature of respondents before being given a hotpack was 35.5 ℃ and after being given a hotpack the average body temperature of respondents was 36 ℃ with an average increase in body temperature of hypothermia after being given a hotpack of 0.44 ℃. With the results of the t-paired test, a significance value of 0.000 was obtained, which showed a p value = 0.000 which is less than 0.05. So it can be stated that there is a significant effect of increasing body temperature on respondents after being given a hotpack.

This is in line with the theory put forward by Potter & Perry (2010) which was quoted by Apriliana (2023) explaining that the rewarming process begins when a local response to heat occurs through stimulation of the Ruffini nerve, which is located in the skin which is sensitive to temperature. This stimulation will send impulses from the periphery to the hypothalamus, which will cause awareness of local temperature and trigger an adaptive response to maintain normal body temperature. Until finally the body will be able to cause a systemic response, namely vasoconstriction, so that hypothermia is overcome.

Researchers assume that giving warm compresses using hotpacks is an effective therapy for increasing body temperature in post-operative hypothermia patients because the temperature given through warm compresses using hotpacks can increase tissue metabolism and increase capillary permeability and provide a sense of comfort and calm to respondents. Hotpacks are also easy and practical tools to use repeatedly and also as a form of prevention against shivering.

Conclusion

The results of the study showed that there was an effect of giving warm compresses using hotpacks on increasing body temperature in post-operative patients with hypothermia in the Recovery Room (RR) of Prof. Dr. H. Aloei Saboe Hospital, Gorontalo City with a P-Value of 0.000 (α <0.005.

References

Ahmed, H. A. M., Abdelfatah, D. A. A., Harby, S. S. E., & Gomaa, A. A. (2024). Effect of Perioperative Warming Interventions on the Prevention of Inadvertent Hypothermia among Patients Undergoing General Anesthesia. *Egyptian Journal of Nursing and Health Sciences*, *5*(2), 155-179.

Apriliana, N. P. (2023). *Kombinasi pemberian hot pack dan warmer blanket dalam meningkatkan suhu tubuh pasien dengan anestesi spinal*. Universitas Islam Sultan Agung Semarang.

Baraka, A. A. E., Hassan, E. A., El-Soussi, A. H., & Mohamed, H. E. (2020). Effect of selective brain cooling versus core cooling on achieving target temperature among patients with severe traumatic brain injury. *International Journal of Africa Nursing Sciences*, *13*, 100209. https://doi.org/10.1016/j.ijans.2020.100209

Depkes RI. (2009). *Profil kesehatan Indonesia 2009*. Jakarta: Pusat Data dan Informasi.

Dias, T. L. F., dos AnjosI, C. M., de Andrade, J. M. L., & Funez, M. I. (2022). Analysis of perioperative variables and their relationship with complications in the Post-

Anesthetic Care Unit. *Rev. Enferm. UFSM*, *12*, e42.

Febriani, F., Agustina, M., & Kapadia, R. (2020). Efektivitas selimut elektrik dalam peningkatan suhu tubuh pasien pasca operasi yang mengalami hipotermia: Literature review. *Scientific Journal of Nursing Research*, *2*(2), 50–53. http://ejournal.poltekkes-pontianak.ac.id/index.php/SJNR/index

Firdaus, F., Suandika, M., & Adriani, P. (2022). Hubungan Usia dan IMT dengan Kejadian Hipotermi Pasca General Anestesi di RS Bhayangkara Bengkulu. *Jurnal Inovasi Penelitian*, *3*(7), 6945-6950. https://doi.org/10.47492/jip.v3i7.2314

Fitriani, D., Pratiwi, R. D., Ayuningtyas, G., Murtiningsih, S., & Poddar, S. (2021). The differences in the effectiveness of providing thick blankets and electric blankets with reducing shivering incidence on postoperative patients in surgical installations Dr. Sitanala Hospital Tangerang in 2019. *Malaysian Journal of Medical Research*, 5(4), 28–35. https://doi.org/10.31674/mjmr.2021.v05i04.007

Ghoneim, M. M., Block, R. I., Haffarnan, M., & Mathews, M. J. (2009). Awareness during anesthesia: risk factors, causes and sequelae: a review of reported cases in the literature. *Anesthesia & Analgesia*, *108*(2), 527-535. http://dx.doi.org/10.1213/ane.0b013e318193c634

Hernández-Avalos, I., Flores-Gasca, E., Mota-Rojas, D., Casas-Alvarado, A., Miranda-Cortés, A. E., & Domínguez-Oliva, A. (2021). Neurobiology of anesthetic-surgical stress and induced behavioral changes in dogs and cats: A review. *Veterinary world*, *14*(2), 393. https://doi.org/10.14202/vetworld.2021.393-404

Liu, L. L., & Larson, M. D. (2022). Patient safety during anesthesia: 100 years of progress documented in Anesthesia & Analgesia. *Anesthesia & Analgesia*, *135*(2S), S37-S47. http://dx.doi.org/10.1213/ane.0000000000005906

Motamed, C., Weil, G., Dridi, C., & Bourgain, J. L. (2021). Incidence of severe hypothermia and its impact on postoperative surgical complications and time delay to adjunct treatments in breast surgery cancer patients: a case-controlled study. *Journal of Clinical Medicine*, *10*(16), 3702. https://doi.org/10.3390/jcm10163702

Mukarromah, D. N., & Wulandari, Y. (2019). Pengaruh pemberian hot-pack terhadap grade shivering pada pasien post operasi seksio sesaria di recovery room Rumah Sakit Siti Khodijah Muhammadiyah Cabang Sepanjang. *Universitas Muhammadiyah Surabaya*.

Prastio, I. (2023). *Hubungan Antara Suhu Ruangan Recovery Room Dengan Nadi Dan Tekanan Darah Pasien Post Op Di Rumah Sakit Islam Sultan Agung Semarang* (Doctoral dissertation, Universitas Islam Sultan Agung Semarang).

Pringgayuda, F., & Putra, A. E. (2020). Faktor-faktor yang berhubungan dengan hipotermi pada pasien pasca general anestesi. *Jurnal Penelitian dan Pengabdian Kepada Masyarakat*, *3*(8), 10–21.

Radzikowska-Büchner, E., Łopuszyńska, I., Flieger, W., Tobiasz, M., Maciejewski, R., & Flieger, J. (2023). An overview of recent developments in the management of burn injuries. *International journal of molecular sciences*, *24*(22), 16357. https://doi.org/10.3390/ijms242216357

Ruetzler, K., & Corrales-Martinez, M. J. (2025). Basic Principles and Consequences of Perioperative Hypothermia. In *Basic Sciences in Anesthesia* (pp. 387-400). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-60203-0_20

Salgado, F., Barros, L. L., Auzier, V. H., Barros, G. H. M. T. D., Brazâo, G. P., Dutra, T. A.

P., & Salgado, D. (2023). Hypothermia Effects Observed Under Anesthesia: An Integrative Literature Review. *Journal of Advances in Medicine and Medical Research*, *35*(23), 92-103. https://doi.org/10.9734/jammr/2023/v35i235285

Sari, I. M., Suryani, E., & Endarwat, T. (2022). Pengaruh pemberian hot pack terhadap peningkatan suhu tubuh pada pasien hipotermi pasca general anestesi di ruang pemulihan RS PKU Muhammadiyah Yogyakarta. *Anaesthesia Nursing Journal*, *1*(1), 58–64. https://doi.org/10.29238/anj.v1i1.1163

Simegn, G. D., Bayable, S. D., & Fetene, M. B. (2021). Prevention and management of perioperative hypothermia in adult elective surgical patients: A systematic review. *Annals of Medicine and Surgery*, *72*, 103059. https://doi.org/10.1016/j.amsu.2021.103059

Susatia, B. (2020). Efektivitas pemberian hot-pack terhadap hipotermi pasien post operasi seksio caesaria di recovery room. *Jurnal Keperawatan Terapan*, *2*(3), 36–42.

Yulianita, H., Yudianto, K., Sugiharto, F., Rahmawati, N., & Hidayat, N. N. F. (2023). Intervensi non-farmakologi untuk mencegah hipotermi pada pasien post operasi. *Journal of Telenursing (JOTING)*, *5*(2), 2911–2919. https://doi.org/10.31539/joting.v5i2.7481