ISSN 2354-8428
e-ISSN 2598-8727

JURNAL KEPERAWATAN

KOMPREHENSIF

COMPREHENSIVE NURSING JOURNAL

Published by :

Sekolah Tinggi Ilmu Keperawatan
PPNI Jawa Barat

Vol. 10 No. 5, October 2024

JURNAL KEPERAWATAN KOMPREHENSIF	VOL. 10	NO. 5	Bandung October 2024	ISSN 2354-8428	e-ISSN 2598-8727

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

Research Article

Managing Hypothermia in Emergency Exploratory Laparatomy: A Case Report

Putu Aditya Ika Wulandari[1] | Nyoman Agus Jagat Raya[2]*

[1]School of Nursing, Faculty of Medicine Universitas Udayana, Denpasar, Indonesia

[2]Department of Nursing, Faculty of Medicine Universitas Udayana, Denpasar, Indonesia

***contact**

jagatraya91@unud.ac.id

Received : 24/07/2024
Revised : 25/10/2024
Accepted : 26/10/2024
Online : 31/10/2024
Published : 31/10/2024

Abstract

Aims: The writing of this case report aims to analyze the management of hypothermia in patients undergoing emergency laparotomy in the operating room.
Methods: This research method is a case report study with a retrospective approach by monitoring, interviewing, and using medical data of patients undergoing emergency exploratory laparotomy surgery in the Emergency Operating Room of Prof. Dr. I.G.N.G. Ngoerah Hospital. The data collected were the patient's disease course, diagnosis, actions, and nursing interventions.
Results: In both cases, the temperature was maintained between 35.5°C to 36°C using a combination of warm blankets, mattresses, and warmed NaCl.
Conclusion: This case report concludes that providing warm blankets, warm mattresses, and warm NaCl to wash the abdomen is beneficial in preventing perioperative hypothermia in patients undergoing emergency exploratory laparotomy. The operating room nurse is expected always to monitor the patient's temperature so as not to experience hypothermia.

Keywords:
Emergency, Exploratory Laparotomy, Hypothermia Management, Operating Room Nurse, Perioperative

INTRODUCTION

Emergency surgery is an operation performed on emergency patients who require surgery as soon as possible, and these patients are usually transferred from the emergency room (1). The types of surgery that can be performed in an emergency are Catheter Double Lumen (CDL) insertion, laparotomy, appendicectomy, and Water Seal Drainage (WSD) insertion (2). Laparotomy is one of the emergency surgeries to control bleeding and repair dysfunctional organs (3). Emergency conditions, such as acute intraperitoneal bleeding, uncontrolled gastrointestinal bleeding, blunt or penetrating abdominal injuries, and generalized intraperitoneal sepsis due to gastrointestinal perforation, are the most common indications for emergency laparotomy (4). Based on data from the World Health Organization (WHO), the incidence of laparotomy surgery in the world has consistently increased by 10%. Hospitals worldwide treated 90 million laparotomy patients in 2017 (5). The incidence of laparotomy surgery in Indonesia based on data from the Ministry of Health of the Republic of Indonesia (MOH RI) in 2019 showed that surgical patients in Indonesia reached 1.2 million, and an estimated 32% were laparotomy cases (6).

Complications or problems related to surgery can be caused by the induction of anesthesia, positioning of the patient, and the influence of drugs. One of the most

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

common perioperative complications is hypothermia (7). Hypothermia is when the core body temperature is below 36°C and will affect the work of many other organs (8). Patients with abdominal surgery are one of the groups at risk of perioperative hypothermia because abdominal surgical procedures are one type of major surgery that requires induction of anaesthesia, a long action time compared to minor surgery, and there are open cavities or body parts (9). Hypothermia in emergency laparotomy can also occur due to loss of body heat caused by exposure to a cold environment during surgery (10). So, it is important to monitor the patient's body temperature regularly, starting before, during, and after the action (11).

Management of hypothermia in perioperative nursing based on evidence-based nursing includes various interventions such as observation of body temperature, identification of causes of hypothermia, and increasing patient temperature through passive and active warming both internally and externally. Active warming methods include setting the operating room temperature, giving warmed fluids, using forced air warming devices, circulating-water mattresses, resistive warming systems, self-warming blankets, and humidification warming systems. Passive warming methods include cotton blankets, surgical drapes, and clothing made of reflective composite fabric (12). While various warming methods exist, their combined effectiveness in emergency laparotomy cases remains underexplored and can increase tolerance to the body's regulatory system against shivering (13).

The management of hypothermia in emergency exploratory laparotomy patients' needs to be used as a case report because the management of hypothermia in emergency exploratory laparotomy patients involves several aspects, namely identifying causes, monitoring complications, and treatments that must be carried out in these conditions. In this study, interventions for hypothermia management in emergency exploratory laparotomy patients were carried out based on evidence-based nursing from several journals that were reviewed and analyzed with The Joanna Briggs Institute (JBI) Critical Appraisal. The purpose of this case report is to analyze the implementation of hypothermia management in emergency exploratory laparotomy patients based on evidence-based nursing.

METHODS

This study was a case report with a retrospective approach. This study was conducted in Prof. Dr. I.G.N.G Ngoerah Hospital from April 16, 2024 to April 18, 2024. Data is collected through the patient's disease course, diagnosis, actions, and nursing interventions.

Participants

The population of this study used a small sample of patients who underwent emergency exploratory laparotomy. There were not specific inclusion-exclusion criteria of the sample, however, the researcher randomly selected a sample of two patients who allowed it to be used as the research object, as long as they were adult patients with emergency exploratory laparotomy can be accepted.

Interventions

Both patients diagnosed emergency exploratory laparotomy. Interventions were given to patients based on four journals, and after reviewed the journals. A quality assessment was carried out using the JBI critical appraisal checklist. The journal will be considered qualified or feasible if the overall approach score of the four journals was more than 50%. Of the four journals that have been assessed, all have good quality, above 50%. After reviewed and synthesized the journals, the authors continued to discuss the best nursing practice using warm blankets, mattresses, and warmed NaCl.

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

Data Collection

Due to this study was a case study, the authors approached the nurse in the ward firstly, then continue to find the patients. The authors tried to ask the question to ensure the patient full concertation. This study's samples were Case 1 and Case 2. Data were obtained through interviews, observations, physical examinations, and documentation.

Ethical Considerations

The patient has approved this study by giving informed consent before the action begins and after being given information regarding the purpose of the study, the procedures to be carried out, and the patient's right to refuse if the patient is not willing. Researchers maintain patient privacy and confidentiality by writing the initials or code of the patient's name in the research report.

RESULTS

Table 1. Key Clinical Features and Outcomes Between the Two Cases

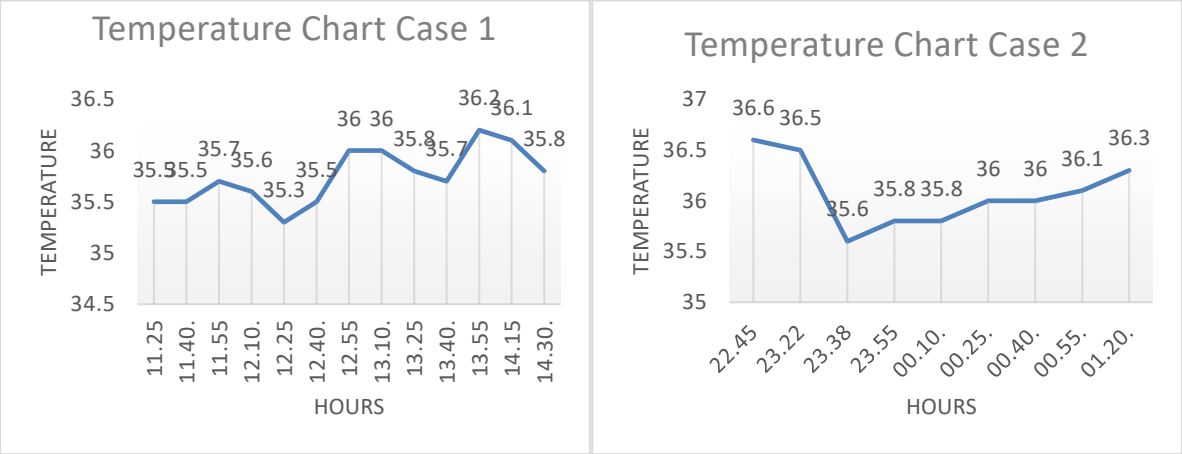
Assessment	Case 1	Case 2
Patients Age	16 years	71 years
Diagnosis	Total Ileus Obstruction e.c. Suspect Adhesion Post appendectomy	Generalized Peritonitis, etc. Suspect Perforation
Anesthesia Type	Supination position with GA-OTT anesthesia	Supination position with GA-OTT anesthesia
Interventions Side-by-side	1. An exploratory laparotomy was performed 2. Adhesioliosis was performed 3. Washing the abdomen with warm NaCl 4. Hypothermia management was carried out with a warm mattress, blanket, and NaCl for abdominal washing. 5. An ileal resection, end-to-end ileo-ileal anastomosis, and band release were performed 6. General anesthesia was used 7. Moderate grade of anesthesia 8. No tissue was excised 9. Lower midline incision was made 10. Clean operation criteria	1. An exploratory laparotomy was performed 2. Adhesioliosis was performed 3. Washing the abdomen with warm NaCl 4. Hypothermia management was carried out with a warm mattress, blanket, and NaCl for abdominal washing. 5. Other procedures were carried out, including repair of gastric primary closure and omental patch 6. General anesthesia and epidural were used 7. Severe anesthesia grade 8. The tissue excised is the gaster 9. The incision made is in the upper midline 10. Criteria for contaminated operations
The Temperature Changes	1. The patient's preoperative temperature was 36.5° C. 2. The operating room temperature was 18.9°C, and the patient was still under anesthesia. 3. In the postoperative period, the patient appeared shivering, temperature of 35.8°C	1. The patient's preoperative temperature was 36.3° C. 2. The operating room temperature is 20°C, and the patient is still under anesthesia; the patient's age is 71 years (elderly) and is more prone to hypothermia 3. In the postoperative period, the

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

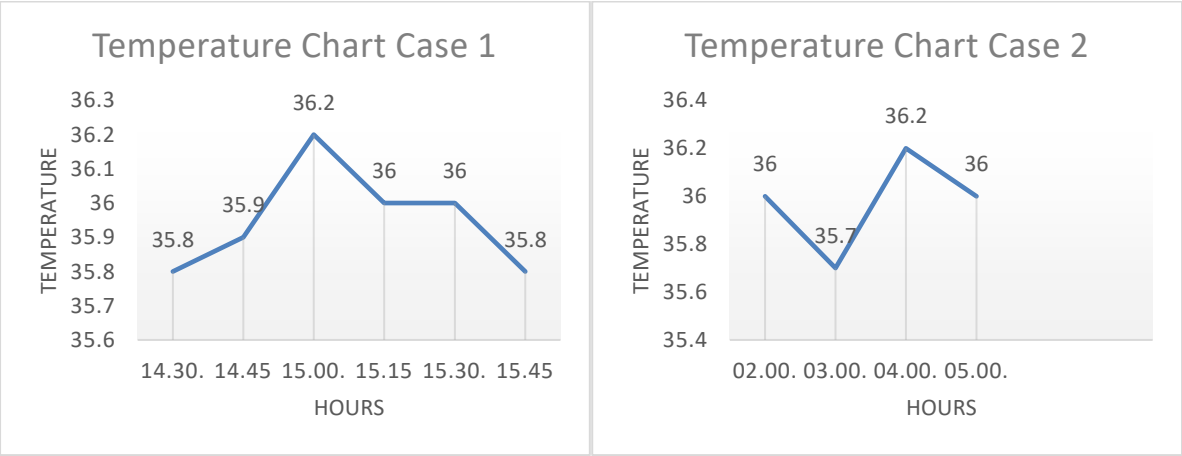
Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

		patient appeared shivering; the temperature was 36°C, the patient's age was 71 years (elderly), more prone to hypothermia
Postoperative Anesthesia Status	1. ASA II with actual problems: Total ileus obstruction without signs of increased intraabdominal pressure (IAP 7.7), with clinical abdomen soepel, bowel noise (+) increased, tenderness (+). Abdominal photograph: partial bowel obstruction.	1. ASA pre-arrival III with problems: CNS: Geriatric with good mini-cognition GIT: Suspect generalized peritonitis rupture hallow organ with clinical pain throughout abdomen: Distension (+), NT throughout the abdomen (+), Bowel noise (+) Normal: Ultrasound image of upper and lower abdomen: still possible retrocecal appendicitis, free fluid image on Morrison Pouch.

Intraoperative and Postoperative Temperature Changes for Case 1 and Case 2



Picture 1. Intraoperative patient temperature



Picture 2. Postoperative patient temperature

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

Table 2. Evidence-Based Nursing Management of Hypothermia in Patients Undergoing Laparotomy

Author (Year)	Research Objectives	Methods	Research Results	JBI's Analysis
Ni Komang Trisia Pratiwi, et al. (2021)	To find out the types of hypothermia management interventions and an overview of their application in perioperative nursing	Journal searches used Google Scholar, ProQuest, PubMed, and Science Direct databases, and they used prevention, management, nursing intervention, perioperative, operating room, operating room, hypothermia, or abdominal surgery.	Patients can receive interventions such as regulating operating room temperature, administering warmed fluids, using forced air warming devices, circulating-water mattresses, resistive warming systems, self-warming blankets, humidification warming systems, cotton blankets, surgical drapes, and clothing made of reflective composite fabric.	The analysis showed that the journal scored more than 50%, or 73%, regarding clarity and sourcing adequate data.
Suantika & Carolina, (2024)	This study aims to determine the comparative effectiveness of using active and passive warmers in managing patients' hypothermia using temperature measurement results.	*pre-experimental static group comparison design*	Warm blankets alone are ineffective in managing hypothermia, so additional interventions, namely hot bag water, are needed.	The analysis shows that this journal has a score of 60%. This research has used standardized and valid measurement tools.
Simegn et al. (2021)	Develop clear clinical practice protocols in the prevention and management of perioperative hypothermia for elective adult surgical patients	This study was conducted per the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines. After formulating clear criteria for the evidence to be included, appropriate search methods were performed using Pub Med, Google Scholar, and the Cochrane Library. The following MeSH terms (hypothermia AND unintentional anesthesia, hypothermia AND perioperative management, and thermoregulation AND anesthesia) were used to pull evidence.	Preoperative hypothermia should be prevented and identified 1-2 hours before anesthesia is administered. Temperature should be measured intraoperatively at least every 15 minutes. The passive heating system increases the ambient temperature and applies warm blankets. At the same time, the active heating system uses infrared lights and electric blankets.	The analysis showed that this journal had a score of 64%. The study assessment criteria and inclusion criteria were appropriate, but there were no suggestions for future researchers.
Sumida et al. (2019)	To determine the effect of warming with lower body blankets on body temperature in anaesthetised patients.	Researchers retrospectively analyzed 5,063 surgical patients. They compared changes in body temperature before and after surgery in patients who used warm blankets covering their bodies (intervention group) and those who used other	Warming with a warmed blanket resulted in a 0.5°C higher body temperature than the control group, which is consistent with the results of this study.	The analysis shows that this journal scores 80%, with cases in the control and intervention groups matched and using valid measurement tools.

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

	warming blankets (control group).

DISCUSSION

Based on the review results, the four journals are feasible because the overall approach score of the four journals is more than 50%. All four journals discuss the provision of warm blankets and warm mattresses effectively to prevent perioperative hypothermia. There are not many journals that discuss the effectiveness of giving warm to wash the abdomen as one of the hypothermia managements in patients with laparotomy. Journals that have been reviewed by researchers show that the intervention of providing warm blankets and warm mattresses is often used and easily applied to prevent hypothermia and maintain patient temperature. We recommend that hypothermia management in patients does not use only one method but a combination, such as warm blankets and warm mattresses, because it is considered less effective if only one method.

Table 3. Case Analysis

Case	The Equation	Difference
Case 1	1. An exploratory laparotomy was performed 2. Adhesioliosis is performed 3. Supination position with GA-OTT anesthesia 4. Washing the abdomen with warm NaCl 5. Hypothermia management is carried out with a warm mattress, blanket, and NaCl for abdominal washing.	1. An ileal resection, end-to-end ileo-ileal anastomosis, and band release were performed 2. The anesthesia used is only general anesthesia 3. Moderate grade of anesthesia 4. No tissue was excised 5. Lower midline incision was made 6. Clean operation criteria
Case 2	1. An exploratory laparotomy is performed 2. Adhesioliosis is performed 3. Supination position with GA-OTT anesthesia 4. Washing the abdomen with warm NaCl 5. Hypothermia management was carried out with a warm mattress, blanket, and NaCl for abdominal washing.	1. Other procedures were carried out, including repair of gastric primary closure and omental patch 2. The anesthesia used is general anesthesia and epidural 3. Severe anesthesia grade 4. The tissue excised is the gaster 5. Upper midline incision was made 6. Criteria for contaminated operations

The laparotomy case that the researcher raised was an emergency exploratory laparotomy case. Exploratory laparotomy is performed to take an in-depth look at the patient's abdomen (14). The indications for emergency laparotomy are divided into several parts, namely emergency laparotomy in non-trauma patients, emergency laparotomy in trauma patients, emergency laparotomy in obstetric patients, emergency laparotomy in patients with malignancy, and emergency laparotomy in critically ill patients (3). Patients with abdominal surgery are one of the groups at risk of perioperative hypothermia (14). It is because abdominal surgical procedures are

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

one type of major surgery requiring induction of anesthesia, a long action time compared to minor surgery, and open cavities or body parts (15).

Perioperative hypothermia has many risk factors, including head injury, ambient temperature of the operating room, shock, spinal cord injury, autonomic nervous system dysfunction, comorbidities, extreme age, wet clothing, thyroid disease, adrenal disease, cardiac dysfunction, liver disease, and colds. IV fluids and blood products, prolonged surgical exposure, type of surgery, general anesthesia >3 hours, epidural and spinal anesthesia, and low preoperative temperature (16). Hypothermia also occurs due to the effects of anesthetic drugs administered before the patients underwent the surgery. Anesthetic drugs suppress oxidative metabolism, which results in a decrease in body temperature (17). This is evident in the difference between case 1, which uses general anesthesia, and case 2, which uses general anesthesia and epidural, so it is classified as a severe level of anesthesia. In case 2, the risk of hypothermia was high due to the excision of the gastric and upper midline area. Laparotomy exploration like this is closely related to the role of anesthesia in controlling body temperature to remain stable, one of which is by monitoring hemodynamic status during intraoperative. Intraoperatively, the room temperature is set to 19-22°C in the tropics (18).

The management of hypothermia in patients with laparotomy is done by using warm mattresses and warm blankets and washing the abdomen with warm NaCl. Abdominal cleansing with warm liquid is generally used in patients with laparotomy because large surgeries and long surgical times make patients vulnerable to hypothermia (19). Based on the literature, interventions with the provision of warm blankets or electric blankets with a temperature of 38°C during surgery can increase the average body temperature. In addition, heat loss can be minimized so that there is a decrease in the incidence of shivering patients (20). The provision of warm blankets can retain body heat so that it can maintain the patient's body temperature during or after surgery (21). The use of warm NaCl for abdominal washing not only aims to clean blood from the abdominal cavity, but abdominal washing with warm NaCl can also help reduce heat loss through exposed surfaces during surgery (22). Nurses have an important role in preventing perioperative hypothermia and must also know and understand perioperative hypothermia management well (23). Before surgery is performed, nurses are responsible for monitoring the patient's temperature and ensuring that the patient's temperature is within the normal range and is suitable for surgery (24). Nurses also play a role in environmental supervision, ensuring the environment or operating room is at the right temperature. Nurses not only perform hypothermia management alone, but they can collaborate with anesthesiologists, surgeons, and other anesthesia nurses to ensure appropriate actions are taken to prevent hypothermia in patients (25). Nurses should proactively adjust room temperatures and collaborate with anesthesiologists to ensure optimal patient outcomes (26).

Patients take several actions after assessment during preoperative, intraoperative, and postoperative to prevent the risk of hypothermia. Actions can include warm blankets, warm mattresses, and warmed fluids. Based on the previous research, warming with a warm blanket produces a body temperature of 0.5 ° C higher (27). When the patient's temperature was around 35.5°C, the researcher collaborated with the anesthesia nurse to raise the patient's temperature by changing the warm blanket on the patient and raising the room temperature from 18°C to 20°C. After the intervention, the patient's temperature slowly increased to 36.1°C. To maintain the patient's

https://doi.org/10.33755/jkk

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

temperature in the range of 35.5-36°C, the surgeon performed abdominal cleansing with warmed NaCl to prevent a decrease in temperature if given NaCl that was not warmed. The use of warm blankets alone is not sufficient to increase the patient's temperature. Warm blankets alone do not effectively manage hypothermia (21). Hence, adding warmth in other ways is necessary. Some hospitals also apply other ways to prevent perioperative hypothermia, such as using active heating infrared lamps (16). Based on the evaluation results of these actions, it was found that both Case 1 and Case 2 did not experience in decrease in perioperative hypothermia. Case 1 and Case 2 did not experience a drastic decrease in temperature, and the temperature range was still between 35.5-36 ° C.

This case report is limited by the small sample size-institution setting, which may limit the generalizability of the findings. It was only two cases were compared, so further research is needed to determine the effectiveness of hypothermia management in emergency laparotomy with the larger sample size. In addition, the JBI's score result based on the authors' perspective and it is needed from another perspective.

CONCLUSION

The results of interventions taken from journals that have been analyzed using The JBI critical appraisal checklist by providing warm blankets, warm mattresses, and cleaning the abdomen using warm NaCl are effective in increasing and maintaining the temperature of patients at risk of perioperative hypothermia. Nurses have an important role to play in preventing hypothermia by implementing routine temperature monitoring at 15-minute intervals or adopting combined warming strategies during long surgical procedures. Based on this idea, it is hoped that nurses will better understand the interventions that can be done to prevent hypothermia, evaluate existing hypothermia management protocols, and look for updates with the latest evidence in research related to perioperative hypothermia management. Surgical room nurses are expected to always carry out temperature monitoring in emergency exploratory laparotomy patients to prevent hypothermia in patients, considering that laparotomy surgery is an action that risks making patients hypothermic due to the surgical process.

REFERENCES

1. Utami DD, Febriani RT, Kurniawan AS. Hubungan Ketepatan Estimasi Durasi Operasi dengan Utilisasi Kamar Operasi Elektif di Instalasi Bedah Sentral RSUD Dr. Saiful Anwar Malang. 2024;5(2):514–21. DOI: https://doi.org/10.54832/phj.v5i2.657
2. Suleman U, Wagiu AMJ, Tangel SJC. Gambaran Pasien yang Menjalani Prosedur Bedah Emergensi di RSUP Prof. Dr. R. D. Kandou Manado Periode Januari - September 2019. e-CliniC. 2019;8(1):127–31. https://doi.org/10.35790/ecl.v8i1.27356
3. Ahmed A, Azim A. Emergency laparotomies: Causes, pathophysiology, and outcomes. Indian J Crit Care Med. 2020;24:S183–9. https://doi.org/10.5005/jp-journals-10071-23612
4. Gejoe G, Yadev I, Rahul M. Emergency Laparotomies at a Tertiary Care Center—a Hospital-Based Cross-Sectional Study. Indian J Surg. 2017;79(3):206–11. https://doi.org/10.1007/s12262-016-1446-5
5. Novitasari D, Aprilianto AK, Sebayang SM. Implementasi Terapi Musik Untuk Menurunkan Nyeri Pasien Post Operasi Laparatomi. J Pengabdi Kpd Masy - Aphelion [Internet]. 2023;5(JUNI):207–12. https://doi.org/10.37287/jpm.v6i2.3511
6. Alidina S, Kuchukhidze S, Menon G, Citron I, Lama TN, Meara J, et al.

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

Effectiveness of a multicomponent safe surgery intervention on improving surgical quality in Tanzania's Lake Zone: Protocol for a quasi-experimental study. BMJ Open. 2019;9(10):1–9. https://doi.org/10.1136/bmjopen-2019-031800

7. Wahyuni N, Sukmaningtyas W, ... Gambaran Faktor Waktu Pulih Sadar pada Pasien Post General Anestesi di Ruang Instalasi Bedah Sentral RSUD dr. R. Goeteng Taroenadibrata Purbalingga. ... J Inov dan ... [Internet]. 2023;1(2):184–97. https://doi.org/10.35870/ljit.v1i2.2117
8. Pringgayuda F, - P, Putra AE. Faktor-Faktor Yang Behubungan Dengan Hipotermi Pada Pasien Pasca General Anestesi. J Kesehat Panca Bhakti Lampung. 2020;8(1):10. https://doi.org/10.47218/jkpbl.v8i1.75
9. Rositasari S, Mulyanto, Dyah V. Efektifitas pemberian blanket warmer pada pasien pasca sectio caesaris yang mengalami hipotermi si RS PKU Muhammadiyah Surakarta. J Ilmu Keperawatan Indones. 2017;10(1):107–20.
10. Mulyo RA, Faozi E, Mulyantini A. Terapi Selimut Aluminium Foil Sebagai Evidence Based Nursing Untuk Meningkatkan Suhu Pada Pasien Hipotermi Post Operasi. Semin Nas Keperawatan Univ Muhammadiyah Surakarta. 2020;(2018):69–72.
11. Aditama K, Handayani RN, Hikmanti A, Spinal A, Oprasi L. Gambaran Karakteristik Responden pada Pasien Spinal. J Ilmu Kesehat Mandira Cendikia. 2024;3(3):31–6.
12. Pratiwi NKDT, Raya NAJ, Puspita LM. Manajemen Hipotermia Dalam Keperawatan Perioperatif Pada Pasien Yang Menjalani Pembedahan Abdomen: a Literature Review. Coping Community Publ Nurs. 2021;9(5):497.
13. Nayoko. Perbandingan Efektifitas Pemberian Cairan Infus Hangat Terhadap Kejadian Menggigil Pada Pasien Sectio Caesaria Di Kamar Operasi. Keperawatan Muhammadiyah. 2019;1(1):86–92.
14. Ramadani FA, Mappaware NA, Ismail NF. Analisis Kasus Kehamilan Ektopik Tergangggu Dalam Perspektif Medis, Bioetik Dan Islam. Prepotif J Kesehat Masy [Internet]. 2023;7(3):16689–93. https://doi.org/10.31004/prepotif.v7i3.21859
15. Dewi OS, Sebayang SM, Firdaus EK. Gambaran Derajat dan Lama Kejadian Shivering pada Pasca Anestesi Umum Di Ruang Pemulihan. J Penelit Perawat Prof. 2024;2(5474):1333–6. https://doi.org/10.37287/jppp.v6i3.2608
16. Simegn GD, Bayable SD, Fetene MB. Prevention and management of perioperative hypothermia in adult elective surgical patients: A systematic review. Ann Med Surg [Internet]. 2021;72(November):103059. https://doi.org/10.1016/j.amsu.2021.103059
17. Siswoyo C, Imam S S, Siyoto S. Analisis Faktor yang Berpengaruh terhadap Peningkatan Biaya Perawatan Pasca Operasi. J Penelit Dan Pengemb Kesehat Masy Indones. 2020;1(37):18–25. https://doi.org/10.15294/jppkmi.v1i1.41432
18. Prasetyoadi P dani. Menggunakan Mikrokontroller Arduino Dan Metode Logika Fuzzy Studi Kasus : Rumah Sakit Umum Nabire Papua. Fateska. 2016;1(1):11–20.
19. Holijah Y. Analisa Praktik Klinik Keperawatan pada Pasien Post Laparatomi Atas Indikasi Ileus Obstruktif Imobilisasi dengan Intervensi Inovasi Terapi Massage Punggung Vco Terhadap Penurunan Resiko Ulkus Decubitus Diruang ICU

p-ISSN : 2354 8428 | e-ISSN: 2598 8727

Jurnal Keperawatan Komprehensif
Volume 10 Issue 5 October 2024

RSUD Abdul Wahab Sjahranie Samarinda Tahun. 2018; Available from: http://link.springer.com/10.1007/978-3-319-76887-8%0Ahttp://link.springer.com/10.1007/978-3-319-93594-2%0Ahttp://dx.doi.org/10.1016/B978-0-12-409517-5.00007-3%0Ahttp://dx.doi.org/10.1016/j.jff.2015.06.018%0Ahttp://dx.doi.org/10.1038/s41559-019-0877-3%0Aht

20. Fitriani D, Pratiwi RD, Ayuningtyas G, Murtiningsih S, Poddar S. 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, Indonesia in 2019. Malaysian J Med Res. 2021;5(4):28–35. https://doi.org/10.31674/mjmr.2021.v05i04.007
21. Suantika PIR, Carolina AI. (The Effectiveness Of Active And Passive Warming In The Management Of Hypothermia In Patients Undergoing Abdominal Surgery At Bali Mandara Hospital). 2024;8(1):15–21. https://doi.org/10.37294/jrkn.v8i1.536
22. Fitrianingsih F, Sukmaningtyas W, ... Gambaran Kejadian Hipotermia pada Pasien Sectio Caesarea Pasca Anestesi Spinal di Rumah Sakit Ibu Anak (RSIA) Ummu Hani Purbalingga. J Penelit Dan Pengemb Kesehat Masy Indones [Internet]. 2020;14–21. Available from: https://prosiding.uhb.ac.id/index.php/SNPPKM/article/view/1016%0Ahttps://prosiding.uhb.ac.id/index.php/SNPPKM/article/download/1016/360
23. Sari NMS, Raya NAJ. Case Report Of Perioperative Nursing: Body Temperature Management In Surgery Patient Of Mitral Valve Repair With Cardiopulmonary Bypass. J Ilmu Keperawatan Med Bedah. 2023;6(1):43–55. http://dx.doi.org/10.32584/jikmb.v6i1.1813
24. Yang F, Wang J, Cui J, Zhuan J, Hu X, Chen S. An Overview of the Implications for Perianesthesia Nurses in terms of Intraoperative Changes in Temperature and Factors Associated with Unintentional Postoperative Hypothermia. J Healthc Eng. 2022;2022. https://doi.org/10.1155/2022/6955870
25. Munday J, Delaforce A, Forbes G, Keogh S. Barriers and enablers to the implementation of perioperative hypothermia prevention practices from the perspectives of the multidisciplinary team: A qualitative study using the Theoretical Domains Framework. J Multidiscip Healthc. 2019;12:395–417. https://doi.org/10.2147/JMDH.S209687
26. Yanto A. Relationship between nurse's performance and responsibilities with the patient's pickup time in the recovery room. Media Keperawatan Indones. 2020;3(2):90. https://doi.org/10.26714/mki.3.2.2020.90-98
27. Sumida H, Sugino S, Kuratani N, Konno D, Hasegawa JI, Yamauchi M. Effect of forced-air warming by an underbody blanket on end-of-surgery hypothermia: A propensity score-matched analysis of 5063 patients. BMC Anesthesiol. 2019;19(1):1–8. https://doi.org/10.1186/s12871-019-0724-8