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EFFECT OF BLANKET WARMER USE ON SHIVERING PATIENTS POST REGIONAL ANESTHESIA: A SYSTEMATIC REVIEW

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ABSTRACT

Shivering is closely related to hypothermy and is one of the serious problems in surgical patients and can adversely affect the patient's condition. In addition, shivering is also considered an important clinical problem to get attention to, especially since it affects the patient's comfort and increases metabolic needs that can cause problems and complications in the cardiovascular. One of the non-pharmacological interventions that can be applied is the use of a blanket warmer. Evidence related to the application of blanket warmers to treat shivering in post-regional anesthesia patients is still limited, therefore, the author is interested in further reviewing the effectiveness of the use of blanket warmers for shivering patients in the form of a systematic review. To identify the effectiveness of blanket warmers against shivering in post-regional anesthesia patients based on evidence-based research. This research is a literature study with the PRISMA approach. Systematic review using PICO. The search databases used are Google Schoolar, Pub Med, Scince Direct, Wiley Online Liberary with the keywords blanket warmer, shivering, and regional anesthesia. Result: Based on 8 research articles reviewed, it was found that blanket warmers were shown to be effective in treating shivering in post-regional anesthesia patients. The intervention technique is applied using a warm blanket increasing the body temperature. The intervention group gained an average time faster compared to the control group. Blanket warmer interventions such as electric blanket warmer, water warmer blanket, blanket blower warmer, warm blanket significantly improve body temperature in shivering post regional anesthesia patients.

KEYWORDS *Industry 4.0, Readiness Index, Roadmap, Food Industry, Mixed Method*

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INTRODUCTION

Anesthesia is a procedure to eliminate pain consciously (spinal anesthesia) or unconsciously (general anesthesia) to create optimal conditions during surgery (Rahmawati, 2020). The use of regional anesthesia techniques remains an option for cesarean section, abdominal surgery, and lower extremity operations because this technique keeps patients conscious, allowing for faster recovery and mobilization (Marwoto and Primatika, 2013).

The impact of anesthesia on thermoregulation and exposure to cold environments leads to hypothermia in most surgical patients. Shivering is usually triggered by hypothermia conditions. Hypothermia is a condition where the body's mechanisms for temperature regulation struggle to cope with cold temperature pressure. Hypothermia can also be defined as an internal body temperature below 36°C (Rositasari & Dyah, 2017). However, shivering also occurs in normothermic patients during the perioperative period.

The etiology of shivering is not yet fully understood, while shivering due to induced cold thermoregulation remains a clear etiology. This phenomenon is also associated with many other causes such as pain, unimpeded spinal reflexes, decreased sympathetic activity, and respiratory alkalosis. The conventional explanation for shivering is the sudden disappearance of anesthesia-induced thermoregulation inhibition, leading to an increase in the shivering threshold towards normal. The difference between continuously low body temperature and a shivering threshold approaching normal activates simple thermoregulatory vibrations (Lopez, 2018).

Shivering is a form of anesthesia complication. Shivering during anesthesia procedures is a common complication in modern anesthesia. Temperature regulation disorders in spinal anesthesia are more severe than epidural anesthesia. Peripheral vasodilation effects in spinal anesthesia cause heat transfer from the central compartment to the peripheral compartment, leading to hypothermia. The height of the achieved spinal block is directly related to the shivering threshold of the patient, so the higher the resulting block, the lower the patient's shivering threshold. Post-anesthesia shivering is a compensatory mechanism of the body that can also cause adverse effects (Laksono & Isngadi, 2012).

The incidence of shivering occurring after spinal anesthesia ranges from 30% to 33% (Lopez, 2018). The incidence of post-spinal anesthesia shivering is between 50% and 80% (Kabuye et al., 2016). The incidence of Post Anesthetic Shivering (PAS) in patients who have undergone surgery is around 33% - 56.7% (Mashitoh et al., 2018). Shivering management is divided into two categories: non-pharmacotherapy and pharmacotherapy (Fatoni et al., 2014). Efforts to address shivering effects due to postoperative hypothermia through pharmacotherapy include drugs, both opioid and non-opioid, which have been proven to address postoperative hypothermia, such as pethidine, tramadol, clonidine, and meperidine.

Administration of drugs certainly results in side effects such as nausea, vomiting, and respiratory depression. Non-pharmacotherapy includes various mechanical interventions such as warm infusion fluids, heat lamps, warming blankets, warming mattresses, warm humidifiers, and increasing room temperature, pressure heating systems, electric mattresses and blankets, and water mattresses and

covers (Horosz & Malec-Milewska, 2019). The administration of regional anesthesia to surgical patients can cause hypothermia due to its impact on thermoregulation and exposure to cold environments, often triggering shivering.

Shivering, considered a significant clinical problem, can be addressed non-pharmacologically, one of which is by using a warmer blanket. The problem statement in this systematic review is whether the use of a warmer blanket affects shivering in patients post regional anesthesia. The general objective of this review is to analyze the impact of using a warmer blanket on patients experiencing shivering post regional anesthesia based on evidence-based research. Specific objectives involve identifying the types of interventions, techniques, and duration of using a warmer blanket, as well as other intervention techniques combined to address shivering in patients post regional anesthesia, with reference to evidence-based research.

RESEARCH METHOD

Article Search Strategy

The design of the article used is a systematic review referring to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). The synthesized data is the intervention of using a warmer blanket on patients with shivering post regional anesthesia in the form of Quasi Experiment and Randomized Control Trial (RCT). Framework Used The search process begins with formulating PICO, which is used to guide the authors in the clinical search for articles. PICO is an acronym for P (patient, population, problem), I (intervention, prognostic factor, exposure), C (comparison, control), and O (outcome). The formulation of PICO in this systematic review is P = patients with shivering post regional anesthesia; I = use of a warmer blanket; C = the presence of a control group that can be compared with the intervention group; O = disappearance of shivering post regional anesthesia after using a warmer blanket. Keywords Used Article searches to obtain specific articles according to the theme use keywords. Keywords provide convenience for readers to quickly understand the essence of the article. Keywords used by the authors in article searches include:

1. "Warmer Blanket" OR "Blanket warmer" OR "Warming Blanket" AND "Shivering" AND "Post regional anesthesia".
2. "Blanket warmer" AND "Shivering" AND "Regional anesthesia"
3. Warmer Blanket OR Blanket warmer AND Shivering AND Regional anesthesia

Databases or Search Engines Used

A database is a collection of logically related data designed to complement the information needed. Database searches in this systematic review were conducted in October 2022. The databases used include Google Scholar, PubMed, Science Direct, and Wiley Online Library.

Inclusion and Exclusion Criteria

Selection of articles is carried out according to inclusion and exclusion criteria. Inclusion criteria in this systematic review are international articles, articles

published or published from 2012-2022 and provided with access facilities (open access journals), articles used are full-text original research articles with interventions using a warmer blanket, randomized control trial design methods, random clinical trial, or quasy experimental with control group design. Exclusion criteria are criteria outside the inclusion criteria. Exclusion criteria in this systematic review are articles with topics unrelated to the use of warmer blankets in patients with shivering post regional anesthesia and articles based on literature reviews/systematic reviews/meta-analyses.

Study Selection and Quality Assessment

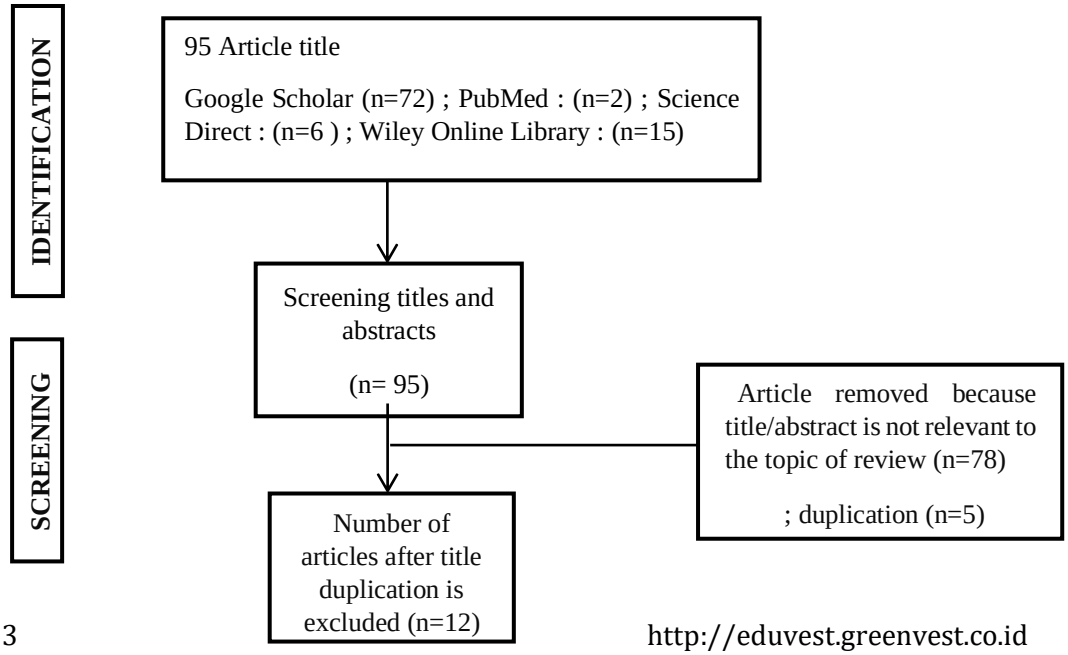
Results of article search and study selection

Article searches were conducted electronically using several databases, including Google Scholar, Pubmed/NCBI, Wiley Online Library, with details:

1. "Blanket warmer OR Warming blanket AND “Shivering” AND “Regional anesthesia”: Google Scholar 72 articles
2. "Blanket Warmer" AND "Shivering" AND "Regional Anesthesia": Wiley Online Library 15 articles, Pub Med 2 articles
3. Blanket Warmer AND Shivering AND Regional Anesthesia: Science Direct 6 articles

The search results from several databases obtained were then examined and reviewed. The authors checked the relevance of the titles to the topic to be analyzed. Titles and abstracts that were irrelevant were excluded from the article search process (n = 83). Abstracts that were not relevant to the topic and did not meet the article criteria were excluded from the search process. The authors ensured that there were no duplicate titles of articles obtained from the Google Scholar, Pubmed/NCBI, Wiley Online Library, Science Direct databases (n = 12). After that, the article search continued by looking at the full text of the articles. Furthermore, the full-text articles were assessed for suitability (n = 12). Articles included in the systematic review (n = 8). This resulted in a comprehensive series of articles according to the selected topic.

The article search flow can be seen in the diagram of figure 2.1



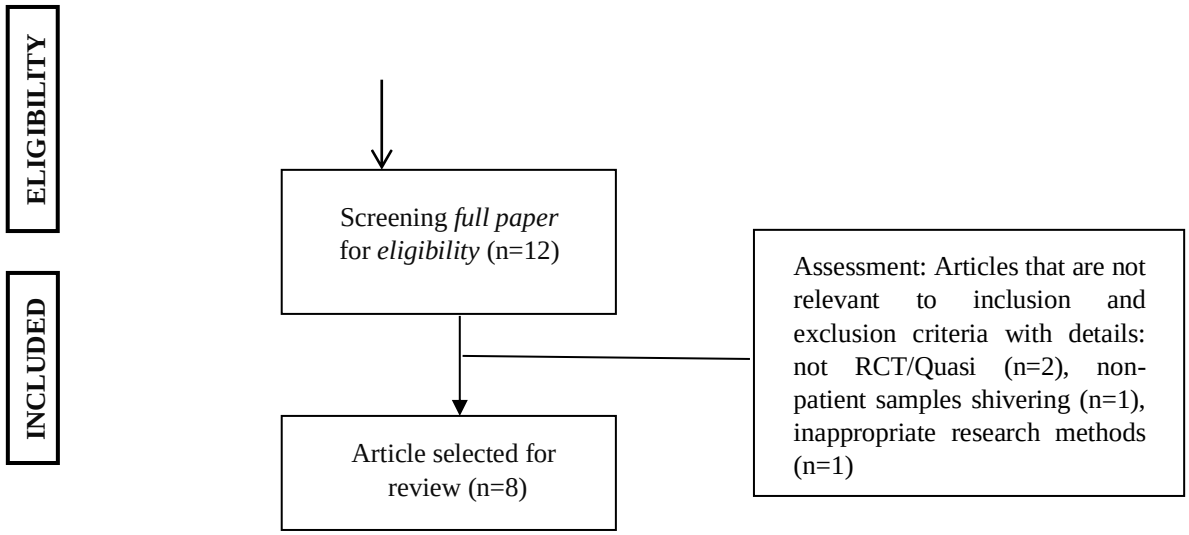


Figure 2.1 Diagram of article search results based on PRISMA

Article Quality Assessment

Selected articles are critically assessed which assesses the methodology of a research methodology. The instrument used is the CASP JBI 2020 (Critical Appraisal Skills Program 2020) questionnaire. Assessment is focused on assessing the quality of the methodology, possible biases in design, behavior, and analysis. This questionnaire contains different question items for each research design. The list of questions for research with randomized controlled trial *(RCT) design has 13 questions, while the list of questions for* non-randomized research such as *quasi-experiments* there are 9 questions. Each question must be answered with a clear yes/no/no and no applies. The answer "yes" will get a score of 1 and the other answers get a score of 0, then the results are divided by the total number of questions and multiplied by 100%. Quality is good when the score is 100-80%, quality is enough 79-50%, and quality is less <50%.

No.	Item	Article quality assessment							
		1	2	3	4	5	6	7	8
	Is it clear in the study what is the 'cause' and what is the 'effect' (i.e. there is no confusion about which variable comes first)?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Were the participants included in any comparisons similar?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**

	Was there a control group?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Were there multiple measurements of the outcome both pre and post the intervention/exposure?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analyzed?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Were the outcomes of participants included in any comparisons measured in the same way?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Were outcomes measured in a reliable way?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Was appropriate statistical analysis used?	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**	**Y**
	Percentage (%)	100%	100%	100%	100%	100%	100%	100%	100%
	RESULT	Include	Include	Include	Include	Include	Include	Include	Include

**Yes* (Y), *No* (N), *Unclear* (U), *Not Applicable* (NA)
* 1 (Article 1), 2 (Article 2), 3 (Article 3), 4 (Article 4), 5 (Article 5), 6 (Article 6), 7 (Article 7), 8 (Article 8)

List of Selected Articles for Analysis

At first, 575 articles were identified as relevant based on the keywords set. The author screened the article and found 11 potential abstracts for review. After checking the complete articles according to the criteria and checking the quality of the articles, 8 articles were obtained that met the criteria for analysis. The results of the articles selected for analysis can be seen in the following table.

Table 2.3. Articles selected for analysis

No.	Article Title	Researchers
1.	*Management Of Shivering In Post Spinal Anesthesia Using Warmer Blankets And Warm Fluid Therapy*	Arina Qona'ah, Novi Enis Rosulina, I Made Amartha Bratasena, Wahyu Cahyono (2019)
2.	*Elektrik Blanket Dapat Mengurangi Kejadian Menggigil Dan Hipotermi Pada Pasien Post Operasi Sectio Caesarea*	(Susanto, 2022)
3.	*Efektifitas Penggunaan Elektricblanket Pada Pasien Yang Mengalami Hipotermi Post Operasi Di Instalasi*	(Suswitha, 2019)

No.	Article Title	Researchers
	Bedah Sentral (Ibs) Rumah Sakit Umum Daerah Palembang Bari	
4.	*The Effects Of Forced Air Warming System Plus Electric Blanket For Eldery Patients Undergoing Transurethral Resection Of The Prostate*	Rui Zhang, MD, Xueli Chen, MD, Yan Xiao, MD (2018)
5.	*The Differences In The Effectiveness Of Providing Thick Blankets And Electric Blanket With Reducing Shivering Incidence On Postoperative Patients In Surgical Installations DR. Sitanala Hospital Tangerang*	Dewi Fitriani, Rita Dwi Pratiwi, Gita Ayuningtyas, Sri Murtiningsih, Sandeep Poddar (Fitriani et al., 2021)
6.	*Pengaruh Pemberian Selimut Hangat Terhadap Perubahan Suhu Sentral Pasien Pasca Operasi Dengan Anestesi Blok Subarachnoid Di RSSA Malang*	Djatmi Ekorini, Sih Ageng Lumadi (2020)
7.	*Combination Of Warm Infusion Fluid And Warm Electric Blanket On The Body Temperature Of Patients Post Section Caerasea*	Tri Nova Aprianti, Ta'adi Ta'adi, Arwani Arwani, Roro Endang Pujiasstuti, Mardiyono Mardiyono (Aprianti et al., 2022)
8.	*Pengaruh Selimut Elektrik Terhadap Peningkatan Suhu Pasien Post Section Caesarea Di Kamar Bedah Rumah Sakit Awal Bros Pekanbaru*	Rizki Sari Utami Muchtar, Rica Febra Masda (Muchtar, 2021)

Data abstraction

Data is extracted independently by authors and supervisors using the created data extraction standards. Data extraction includes title, type of article, research location, author, objectives, research design, sample and sample techniques, interventions, instruments/outputs measured, and research results. The synthesis process in article *review uses* quantitative systematic review *methods* by identifying research questions, developing research protocols, determining the location of research databases, selecting relevant research results (reading the entire content of articles, keywords, and themes), selecting quality research results, extracting data from individual studies, synthesizing articles, and presenting research results in reports Research Results.

RESULT AND DISCUSSION

Review Results

Literature search results found 8 articles that met the criteria on Google Scholar, Pubmed/NCBI, Wiley Online Library, and Pub Med. The articles were published from 2018 to 2022. The research locations were in Indonesia (7 articles or 87.5%) and China (1 article or 22.5%). The assessment results using Joanna Briggh Institute (JBI) CASP (Critical Appraisal Skills Programme 2020) obtained 8 articles with good quality. Then, the selected articles were data extracted into

tables to obtain information including the title, authors, research method/design, intervention techniques, samples and sample techniques, measured outcomes, and research results. This study conducted a review of 8 articles on the effects of using a warmer blanket on patients with shivering post regional anesthesia.

Article Characteristics

The first article (Arina et al., 2019) used a quasi-experimental research design with a control case with the aim of comparing the effectiveness of warmer blankets and warm fluid therapy in managing shivering. The sample involved 60 respondents. The strengths of the first article are relevance to the topic, detailed description of the intervention procedures, the design used is appropriate for evidence-based research, this research article compares two types of interventions that can be considered in nursing care interventions for patients with shivering post-operation. The weakness is that the tools used for the intervention are still manual, thus requiring further development.

The second article (Susanto, 2022) is a quasi-experimental study with a one-group pretest-posttest design aimed at determining the effect of an electric blanket on shivering events and body temperature increase in post-operative sectio caesarea patients experiencing hypothermia in the recovery room. The sample size was determined by total sampling and involved 30 respondents. The strengths of this article are relevance to the topic, detailed description of the intervention type, comprehensive and systematic depiction of observation results before and after treatment, and appropriate and comprehensive use of statistical tests. The weakness is that the characteristics of the sample in terms of respondent ages varied from 21 to 36 years, which may lead to differences in responses to post-operative conditions.

The third article (Suswitha, 2018) used a quasi-experimental research design with a control case aimed at determining the effectiveness of using an electric blanket in managing hypothermia in post-operative patients. The research was conducted at the Central Surgical Installation of Palembang BARI Hospital. The sample size was 22, divided into 2 intervention and control groups. The strengths of this article are the detailed description of the intervention procedures and the systematic elaboration of observation results. The weakness is that the control group used manual tools while the case group used electric tools.

The fourth article (Rui et al., 2018) was a quasi-experimental pre-post test study with two control groups aimed at determining the effect of air heating with an electric blanket on elderly patients experiencing perioperative hypothermia during spinal anesthesia for TURP. The study involved a total of 443 surgical patients from January 2015 to October 2017. The sample was divided into three groups: group E (intraoperative heating using an electric blanket set at 38°C; n = 128); group F (intraoperative heating using air heater set at 38°C; n = 155); and group FE (intraoperative heating using air heater and electric blanket, both set at 38°C; n = 160). The strength of this study lies in the intervention allowing for varied and comprehensive results. The weakness is the long duration required to obtain the desired research results.

The fifth article (Dewi et al., 2019) was a quasi-experimental study with pre-test post-test with control group design aimed at determining the difference in the effectiveness of thick cloth blankets and electric blankets at 38°C in reducing shivering events post-surgery in patients at the Surgical Installation of RS Sitanala Tangerang. The sample involved 30 respondents divided into 2 groups: the thick cloth blanket intervention group (n = 15) and the electric blanket group at 38°C (n = 15). The strengths of this article are relevance to the topic, inclusion of many supporting sources, detailed and systematic description of the intervention procedures, and detailed mention of sample allocation. The weakness is comparing electric equipment with manual equipment.

The sixth article (Djatmi & Ageng, 2021) was a quasi-experimental study with a control group involving 20 respondents. This study aimed to evaluate the effect of a warm blanket on central temperature changes in post-operative patients with subarachnoid block anesthesia. The sample size was determined by random randomized method and divided into control group (n = 10) and intervention group (n = 10). The strengths of this article are relevance to the topic, inclusion of many supporting sources, detailed description of the intervention procedures, and systematic elaboration of observation results. The weakness is the intervention comparing electronic devices with manual ones.

The seventh article (Tri et al., 2022) was an experimental study with a quasi-experimental research design with pretest and posttest with control group designs involving 64 respondents divided into 4 groups: 16 respondents as intervention group 1 given infusion fluids at 40°C, 16 respondents as intervention group 2 given an electric blanket at 44°C, 16 respondents as intervention group 3 given a combination of infusion fluids at 40°C and an electric blanket at 44°C, and 16 respondents as control group given standard procedural action. The strengths of this article are relevance to the topic, inclusion of many supporting sources, detailed description of the intervention procedures, systematic elaboration of observation results, and detailed mention of sample allocation. The weakness is the unequal sample size in each treatment group.

The eighth article (Rizki & Rica, 2021) aimed to determine the effect of an electric blanket on increasing body temperature in post-sectio caesaria patients. This study used a quasi-experimental design with a one-group pretest-posttest design. The sample in this study was post-sectio caesarea patients experiencing hypothermia (32-35°C), totaling 30 people, with accidental sampling technique. The strengths of this article are relevance to the topic, inclusion of many supporting sources, detailed description of the intervention procedures, and systematic elaboration of observation results. The weakness is the sampling process using accidental sampling, which may lead to differences in samples in both the case and control groups.

Intervention Techniques

In the first article (Arina et al., 2019), for the warm fluid infusion, a box measuring 27cm x 25cm x 40cm with a weight of 800 grams, voltage of 110/220V equipped with two 40-watt light bulbs was used. The warm blanket specifications included being made of fine cotton with a plain blue motif, weighing 1 kg, with a length of 150 cm, a width of 2m, and a thickness of 5 cm. Temperature measurement was conducted using an axillary thermometer and observation sheets. Temperature measurements after the intervention were taken four times: at 15, 30, 45, and 60 minutes.

In the second article (Susanto, 2022), the intervention was given by warm fluid infusion through vascular puncture. In the third article (Suswitha, 2018), the intervention group used an electric blanket, while the control group used a regular blanket.

In the fourth article (Rui et al., 2018), the sample was divided into three groups: Group E (intraoperative heating using an electric blanket set at 38°C; n = 128); Group F (intraoperative heating using air heater set at 38°C; n = 155); and Group FE (intraoperative heating using air heater and electric blanket, both set at 38°C; n = 160).

In the fifth article (Dewi et al., 2019), an electric blanket at 38°C was provided from the beginning of patient handover at Sitala Tangerang Hospital until the end of the operation/post-operation. Another tool used was a thick cloth blanket.

In the sixth article (Djatmi & Ageng, 2021), warm blankets were given to the treatment group to assess central temperature changes in patients after subarachnoid block anesthesia.

In the seventh article (Tri et al., 2022), the sample was divided into 4 groups: 16 respondents as intervention group 1 who were given infusion fluids at 40 degrees Celsius, 16 respondents as intervention group 2 who were given an electric blanket at 44 degrees Celsius, 16 respondents as intervention group 3 who were given a combination of infusion fluids at 40 degrees Celsius and an electric blanket at 44 degrees Celsius, and 16 respondents as the control group who were given standard procedural action.

In the eighth article (Rizki & Rica, 2021), respondents were provided with an electric blanket, which was a heating blanket measuring 130-160 cm in length and 210 cm in width. This intervention activity was conducted for 30 minutes when hypothermia occurred.

External Measurement

In the study (Arina et. al., 2019), body temperature measurement with criteria; mild hypothermia (32-360C), moderate hypothermia (28-320C), severe hypothermia (<280C) and normal body temperature (36-37.50C). The second study (Susanto. 2022), Body Temperature *of Sectio Caesarea Patients* Before and After the Intervention.

Mardaneh's study, (Suswitha, 2018), measured the patient's body temperature before and after the intervention. Research (Rui et al. 2018) effect of air heating

with electric blanket in elderly patients experiencing perioperative hypothermia of TURP spinal anesthesia.

Research (Dewi et al. 2019), measured the degree of shivering before, and after the intervention. Research (Djatmi &; Ageng 2021), Changes in temperature before and before intervention was carried out in patients with post anesthesia subarachnoid block.

Research (Tri et al. 2022), body temperature measurement in each group. Research (Rizki &; Rica, 2021), measurement of Body Temperature of Post *Sectio Caesaria Patients*.

Effectiveness of Interventions

In the study (Arina et. al., 2019), the average temperature of patients before the intervention was 35,370C and after the intervention was 35,550C at 15 minutes, 35,790C at 30 minutes, 36,060C at 45 minutes and 36,170C at the 60th minute. There was a significant difference in body temperature between before and after both the intervention and the control group. There was a significant difference in temperature between the warm liquid and the warming blanket at minutes 30, 45 and 60. At 30 minutes and 45 minutes in the comparison between the warm fluid and control groups and at 60 minutes in the warm blanket and control comparison groups.

The second study (Susanto. 2022), Body temperature in patients after caesarea section *surgery in the recovery room of P Jakarta hospital in 2022 before and after the intervention in the form of an electric blanket and obtained the following* data, the mean value (average) in the patient's body temperature data before the intervention was 34.923 and after the intervention was 36.57 ° C, while for the media value before the intervention was 35.0 ° C and after The intervention was 36,500, while the *minimum value or lowest temperature before the intervention was 34 ° C while after the intervention the lowest temperature was 36 ° C, for the maximum body temperature* measurement before the intervention was 35.5 ° C and after the intervention the maximum temperature was 37 ° C . There is a significant influence between temperature data before and after the intervention in the form of *an electric blanket.*

Research (Suswitha, 2018), The average time needed to reach normal temperature in the intervention patient group with *electric blanket* at Palembang BARI Hospital was 15.9 minutes (95% CI: 14.89 – 16.92), with a standard deviation of 1.5 minutes. the average time required to reach normal temperature was 26.7 minutes (95% CI: 25.77 – 27.68), with a standard deviation of 1.42 minutes. There is a significant difference in the mean time it takes to reach temperatures in the normal range in *electricblankets* and ordinary blankets.

Research (Rui et al. 2018) Body temperature of elderly post-TURP hypothermic patients. The use of an air heating system combined with an electric blanket is effective in maintaining the warmth of elderly TURP patients.

Research (Dewi et al. 2019), Of the 15 postoperative patients before being given electric blankets, almost half (46.7%) had grade 3 chills, while in patients who were given thick cloth blankets almost half (40%) experienced 2nd degree chills. Nearly half (40%) of the electric blanket intervention group had no chills (grade 0), while in patients given regular blankets nearly half (40%) had grade 2 chills. Electric blankets and thick cloth blankets affect the incidence of shivering in postoperative patients at the Surgical Installation dr. RS Sitanala Tangerang, but electric blankets are more effective than thick blankets.

Research (Djatmi &; Ageng 2021), The results of testing the average temperature difference before the treatment and 60 minutes both groups p = 0.0142 with = 0.05 showed a significant difference concluding that temperature changes in post anesthesia patients subarachnoid block. Non-pharmacological treatment of hypothermia patients after subarachnoid block anesthesia using a warm electric blanket is more effective

Research (Tri et al. 2022), The difference in body temperature before being given heating (*pre-test)* obtained *a p-value* of 0.478. While the difference in average body temperature after being given warming *(post-test)* between groups obtained *a p-value of 0.000* ($p<0.005$). There were significant differences in average body temperature between groups. The combination of warm intravenous fluids and warm electric blankets is effective in increasing the body temperature of patients after *sectio caesarea in* the Recovery Room of the Central Surgical Installation of dr. Abdul Aziz Regional General Hospital, Singkawang, West Kalimantan

Research (Rizki &; Rica, 2021), The average body temperature of post sectio caesaria patients before the use of electric blankets in the Surgical Room of RSAB Pekanbaru was 33.70C. The average body temperature of post sectio caesaria patients after the use of electric blankets in the Surgical Room of RSAB Pekanbaru is 34.70C. There is an effect of giving electric blankets on increasing body temperature of post *sectio caesaria patients* in the Surgical Room of Awal Bros Hospital (RSAB) Pekanbaru.

Discussion

Shivering or shivering is a form of anesthetic complication. Shivering under anesthesia is a common complication of modern anesthesia. Temperature regulation disorders in spinal anesthesia are more severe than epidural anesthesia. The effects of peripheral vasodilation on spinal anesthesia cause heat transfer from the central compartment to the peripheral compartment, causing hypothermy. Post-anesthesia shivering is a compensatory mechanism of the body that can also cause adverse side effects (Laksono &; Isngadi, 2012)

Therefore, it is important to prevent PH to reduce side effects on the heart (Bayir et al., 2016). The same is also recommended by the *Association of Fairy Operative Registered Nurses (*AORN), about the importance of preventing Postoperative Hypothermia (PH) for patient safety (Link, 2020).

Surgical actions or surgical procedures have a risk of damage to the integrity or integrity of the body and can even be a threat to the patient's life (Smeltzer & Bare, 2015). Surgery can cause physiological changes in the body, namely a decrease in body temperature or hypothermia that affects several organ systems (Rositasari, et al, 2017)

Based on a literature study in 8 journal articles examining the effect of *blanket warmer* use on *postoperative postoperative anesthesia patients overall, it showed a significant effect of the use of electric blankets in dealing with postoperative shivering patients.*

Non-pharmacological approaches to keep the body from experiencing hypothermia are carried out by warming methods including the use of electric blankets. Hypothermia in postoperative patients so as not to shiver beyond safe limits can be treated by installing an electric blanket. Electric blanket is a device to maintain the stability of the patient's body temperature when the patient experiences hypothermia. This tool basically utilizes the heat flowed by using a blower as a heat conducting medium so that the patient's condition is maintained in a warm state (Rositasari, et al, 2017).

In the *electric blanket* intervention, in addition to heat production from inside the body, heat is also transferred through conduction from outside the body so that to achieve an increase in body temperature will occur faster. This is what causes the *use of electric blankets* to be more effective than the use of ordinary blankets in overcoming hypothermia that occurs in postoperative patients.

In the use of ordinary blankets, there is no conduction of heat from the blanket into the body. Heat production only occurs in the body, the blanket only prevents the release of heat that has been produced by the body and prevents the body from being exposed to cold temperatures again.

CONCLUSION

Based on the results of a literature study of the eight articles above, it can be known the effectiveness of using *blanket warmer* in patients *with postoperative postoperative anesthesia post regional shivering* . This non-pharmacological nursing intervention does not cause side effects, is cheap, and is *applicable* or easy to apply.

It is necessary to develop *a blanket warmer* that can increase effectiveness in overcoming *postoperative post-regional anesthesia shivering* . The hospital prepared SOPs for non-pharmacological therapies for the use of *blanket warmers*

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