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Nursing Interventions for the Prevention of Acute Surgical Wound Infections – A Descriptive Literature Review

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Abstract

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Acute surgical wound infections, a significant yet preventable complication of surgery, impact patient health. This literature review highlights the role of nursing practices in preventing these infections, emphasizing their importance in improving patient outcomes and promoting safer surgical environments.

The purpose of this study is to describe the nursing interventions for preventing surgical wound infections in acute care settings. The study aims to produce new knowledge on evidence-based nursing practices, collaborative approaches, and advanced wound care technologies for preventing surgical wound infections in acute care settings, based on existing research.

The bachelor's thesis is a descriptive literature review. Ten research articles were analysed, which were selected because of a search from PubMed and CINAHL databases. An inductive content analysis was performed on the studies to answer the re-research questions of the bachelor's thesis.

These articles were analysed using inductive content analysis. Subsequently, 20 sub-categories, 11 generic categories, and two main categories were created in the inductive analysis. Two main categories are 1) Intervention for Infection prevention of acute wound infection which resulted from Seven generic categories and 14 sub-categories and 2) How do the interventions prevent acute wound infection? which was created from Four generic categories and 06 sub-categories.

The findings highlight that evidence-based nursing practices are crucial in controlling acute surgical wound infections, enhancing clinical outcomes, and ensuring safety during surgical processes.

Keywords: Surgical Wound Infection, Acute Care Nursing, Infection Prevention, Nursing Interventions

Contents

1 Introduction

Surgical wound infection is a notable and ongoing issue in health practice. In particular, the likelihood of infection rises in acute care settings due to elevated severity conditions and intensive surgical procedures. These infections lead to higher mortality rates, prolonged hospital stays, and increased healthcare costs, making preventing these conditions a primary objective for Healthcare Professionals. Given their crucial role in both perioperative and periprocedural care, the efforts of nurses constitute and essential elements among all strategies for infection prevention. (Smith et al., 2020.)

The literature also emphasizes the role of nursing practices in preventing surgical site infection. For instance, strict compliance to evidence-based wound care protocols such as sterile techniques and selecting appropriate dressings was associated with a notable decrease in the incidence of infection within the acute care setting. (Johnson et al. 2018 Lee and Kim 2019.) Also, the enhanced application of preoperative skin antisepsis protocols using nursing personnel performing an essential function has enabled the assessment of how to measure a reduction in surgical site infections (Brown et al.2020).

The Researchers have also considered other nursing interventions such as the use of advanced wound care technologies, which may further mitigate risks. Recent research has indicated that negative pressure wound therapy, and silver dressings may reduce incidence of infection. (Davis and Clark.2022 Miller et al.2021.) particularly in high-risk populations. Additionally, educational programme and training for patients regarding hygiene immediately before surgery are associated with a notable decrease in their vulnerability to bacterial infection that may lead to more severe infection. (Adams et al.2019 Patel and Green.2020.)

Another important aspect of infection prevention that has been revealed is collaborative teamwork, in which nurses work closely together with other healthcare professionals. Research indicates, in acute care settings, collaborative strategies such as collective decision-making and coordinated care plans enhance the effectiveness of infection. (Harris et al.2021 Williams and Taylor 2019.)

This study aims to describe the impact of nursing interventions on preventing surgical wound infections in acute care settings. Based on existing research, it aims to produce new knowledge on evidence-based nursing practices, collaborative approaches, and advanced wound care technologies for preventing surgical wound infections in acute care settings.

2 Background and key terms

2.1 Surgical wound infections (SWIs)

Surgical wound infections (SWIs), also referred to as surgical site infections (SSIs), occur after surgical procedures at the surgical site. SWIs are categorized into three primary classifications based on the depth and location of the infection superficial incisional, deep incisional, and organ/ space infections. (Kaye et al. 2014.)

Superficial incisional SWIs involve only the skin and subcutaneous tissue surrounding the incision site. These infections generally present within 30 days after surgery and are characterized by erythema, edema, and drainage of pus from the incision site. (Horan et al.2008.) Deep Incisional SWIs involve the underlying soft tissues, such as muscles and fascial layers, surrounding the incision site. These infections may arise within 30 days after surgery or one year if an implant is involved. Clinical manifestations encompass fever, surgical site pain, and purulent material exudation. (Mangram et al. 1999.)

Organ/ Space SWIs occur in any part of the anatomy other than the incision, which has been opened or manipulated during the surgical procedure. These infections can involve organs, cavities, or joints and are frequently more severe, requiring complex treatment and extended hospital stays. (Centers for Disease Control and Prevention 017.)

2.1.1 Causes and risk factors for surgical wound Infection.

The development of SWIs is affected by multiple factors, which can be generally classified as patient-related, procedural, and environmental factors. Patients' specific factors encompass comorbidities such as diabetes, immune suppression, and obesity, which diminish the body's capacity to recover and combat infection. (Kaye et al. 2014.) Age, nutritional status, and smoking habits also substantially contribute to increasing the susceptibility of patients as regards making patients more vulnerable to SWIs (Anderson et al.2014). Procedural factors are re-

lated to the type and duration of the surgical procedure. Prolonged surgical procedures increase the risk of SWIs due to extended exposure of tissues to the environment, which can result in bacterial contamination. Additionally, specific types of surgical procedures, such as abdominal or colorectal procedures, inherently carry a higher risk of infection due to the engagement involvement of the gastrointestinal tract. (Mangram et al.1999.)

The aseptic techniques adhered to by medical staff, the sterility of the operating room, and the sanitation of the surgical instruments are instances of environmental factors. The severity and complexity of SWIs are further exacerbated by the presence of multidrug-resistant organisms (MDROs) in the hospital setting. (Owens & Stoessel, 2008.)

2.1.2 Impact on the healthcare of surgical wound infection

SWIs have a substantial impact on patient outcomes, healthcare costs, and the system's total burden. Patients with SWIs commonly have prolonged hospital admissions, undergo delayed recovery, and have an increased probability of readmission. Considerable morbidity, such as wound complications, the necessity for further surgical procedures, and, in severe cases, mortality, are associated with these infections. (Kirkland et al. 1999.)

As a result of the expenses associated with prolonged hospital admissions, supplementary treatments, and the use of advanced wound care technologies, SWIs constitute a substantial financial strain on the healthcare system (Zimlichman et al. 2013). Based on the type and severity of the infection, managing an individual SWI can cost ranging from $ 3,000 to $ 29,000 on average, according to a study (Anderson et al.2014).

Furthermore, surgical point infections (SWIs) can adversely impact hospital performance metrics such as patient satisfaction scores and quality evaluations, which are increasingly linked to payment in value-based purchasing initiatives. Hospitals encountering elevated SWI rates may face fiscal penalties, thereby emphasizing the essential requirement for robust infection prevention measures. (Umscheid et al.2011.)

2.2 Acute care nursing for surgical wound infection

When it comes to surgical care, acute care nurses are the ones who support patients' preoperative phase, during their operation or procedure, and after they have undergone a medical procedure. The nurses also have various other significant responsibilities to play that are essential for the patient's safety and well-being. (Rathert et al.2017.)

Preoperative phase in the preoperative period, acute care nurses perform comprehensive evaluation design to identify risk factors that can negatively affect surgery and recovery such as existing diseases like diabetes, obesity, or immune deficiencies. In addition, they play a role in patient education for preoperative care such as fasting and medication adjustments to ensure an optimal state of readiness before surgery. (Aiken et al.2018.)

Acute care nurses play a critical role in maintaining a sterile operative environment during the intraoperative phase. Set up surgical instrument, inspect equipment, and adhere to aseptic techniques, and closely monitor the patient's condition and vital signs. They're closely monitoring is necessary to spot deviations that could lead to surgical problems like infections. (Ulrich and Kear.2010.) Acute care nurses continue to monitor patients for infections and other complications during the recovery phase. This includes performing routine assessments, managing bandages, and administering prescribed analgesics or antibiotics. Moreover, educate the families of patients about wound care guidelines and emphasize the importance of adhering to postoperative instructions to reduce the risk of infection. (Rathert et al.2017.)

The first line of defence in preventing surgical wound infections (SWIs) is acute care nurses who deliver direct clinical care and patient education. Reducing the risk of SWIs and improving patient outcomes relies significantly on their ability to identify early infection indicators and initiate timely interventions. (Flynn et al.2016.)

2.2.1 Nursing work environment of acute surgical wound care

The acute care setting is marked by fast paced and significant stress, elements that profoundly impact the execution of infection prevention strategies. In these units, workforce shortages are common, resulting in nurses handling heavy caseloads while attending to severely ill patients. Such conditions can elevate psychological strain and contribute to occupational burnout among nursing staff, potentially compromising their compliance to infection control measures. (Stone et al. 2018.)

The Burden of Workload and Time Constraints: In acute care environments, nurses frequently manage the care of numerous patients, each presenting complex and challenging needs. This heavy workload complicates the maintenance of the constant attentiveness necessary for effective infection prevention. Additionally, time constraints may prompt nurses to bypass protocols or neglect essential practices, including hand sanitation, the correct application of personal protective equipment (PPE), and comprehensive wound management. (Duffield et al. 2018.)

In situations where workforce capacity is inadequate, nurses may prioritize immediate critical interventions over preventive measures, thereby elevating the risk of (Griffiths et al. 2016). Institutional culture plays a significant role in infection prevention. A supportive work environment that emphasizes infection control and empowers nurses to voice potential risks is essential. Hospitals that cultivate a safety-oriented culture and continual improvement typically experience lower infection rates, as healthcare personnel are more inclined to adhere to best practices and report any concerns. (Lopes et al. 2018.)

Therefore, the acute care nursing environment has a significant influence on how easy or difficult it is to implement infection prevention measures. Reducing the frequency of SWIs in these settings requires addressing issues with staffing, workload, and organizational culture. (Aiken et al. 2018.)

2.2.2 Nursing education and training in acute surgical wound care

Simulation-based training has gained significant traction due to its ability to enable healthcare professionals to simulate infection prevention protocols in a controlled setting, replicating real-world scenarios. This practical methodology plays a crucial role in reinforcing theoretical knowledge and boosting nurses' confidence in managing complex cases, particularly those concerning vulnerable surgical patients. (Ulrich & Kear.2018.) Multidisciplinary education is another pivotal aspect, involving ongoing education and training in infection prevention are vital for acute care nurses to stay informed about the most recent research-driven practices and to improve their abilities in preventing surgical wound infections (SWIs). Ongoing professional development guarantees that nurses possess the necessary knowledge and skills to effectively implement infection control strategies within the constantly changing and demanding acute care setting. (Boyle et al. 2019.)

Infection prevention training programs: Structured training programmes cantered on infection prevention are essential for ensuring that acute care nurses are aware of the latest guidelines, newly identified pathogens, and innovative technologies that can support infection control efforts. These programs typically address subjects such as proper hand sanitation, sterilization methods, responsible use of antibiotics, and management of wound care. (Flynn et al. 2016.)

Interdisciplinary collaboration across various disciplines like anaesthesiologists, and infection control specialists. This enhances interprofessional communication, essential for effective infection prevention Through education, healthcare members ensure alignment in their control practices, consequently reducing occurrence of surgical site infections. (Rathert et al. 2017.)

Maintaining high standards of patient care and lowering the risk of SWIs require acute care nurses to make continues educational commitment. To effectively prevent infections as the healthcare environment changes, nurses must have access to the most recent information and tools. (Boyle et al. 2019.)

2.3 Infection prevention of surgical wound

From a clinical perspective, the control of infection is a very important factor as far as the protection of patients in the operating theatres is concerned as they are the most susceptible to infections. There are several evidence-based recommendations such as the ones developed by the centres for disease control and prevention (CDC) and the World Health Organization (WHO) that have been developed to assist in the prevention of infections. (CDC. 2017. WHO. 2016.)

The CDC's SSI prevention guidelines have been followed and applied across the globe by most countries. These guidelines underline important measures in the preoperative, intraoperative, and postoperative phases that are aimed at preventing infection. Intraoperative measures mainly concentrate on creating a clean wound area, controlling blood sugar levels, and completing the surgery in the shortest time possible (Anderson et al. 2014). The WHO also supplies additional instruments that are directed at improving the safety of surgery and which equally consider the prevention of their endemic infections, one of which is the surgical safety checklist. For example, it includes confirmation of the administration of preoperative antibiotics and preparations as well as the assurance that the surgical instruments remain sterile. (Haynes et al. 2009.) It has been evidenced through studies that the use of these protocols decreases rates of complications and infections after surgery in countries around the world. These are guidelines well recognized internationally and represent the core principles of infection prevention in a surgical environment, providing the clinical staff with the mechanisms to mitigate the likelihood of infections and promote the safety of patients. (Weiser et al. 2010.)

2.3.1 Aseptic techniques for prevention of surgical wound infection

The role of aseptic techniques is essential in controlling and managing the risk of infections that occur after surgical interventions, notably, surgical wound infections. These practices are concerned with the creation and preservation of sterility so that the probability of pathogen transfer during operations is very low.

First is the cleaning and sterilization of all the surgical tools and the surgery area, which are vital in preserving aseptic techniques. Surgical instruments are cleaned using high steam sterilization, where the temperature is raised to kill all the microorganisms and render the instruments free of any of them. In addition, applying antiseptics, like chlorhexidine or iodine, to the skin of the patient is normal before surgery to lower the number of germs present. (Darouiche et al. 2010.)

Another proactive measure towards achieving asepsis is the preparation of the surgical site where many sterile drapes are put, and an effective skin antisepsis is also performed. This is important to reduce the chances of a microbial infection conflict occurring during the procedure. The use of aseptic techniques is important in aiding in the operational environments, thereby further helping in reducing the incidence of spinal surgical wound infections and enhancing the outcome of the patients. (Mangram et al. 1999.)

2.3.2 Emerging trends in prevention

The demand for infection prevention is on the rise due to many factors including the continuous global advancement of technologies and medical solutions to minimize the incidence of infections in surgical wounds. These developments offer alternatives for infection and improve results for patients in surgical procedures. (Abbate et al. 2017.)

Also, advanced wound care therapies such as negative pressure wound therapy (NPWT) have gained popularity for their healing benefits and their ability to minimize bacteria in wounds. NPWT uses controlled negative pressure to enhance the outflow of exudate and bacteria creating a stable environment where healing is accelerated. (Banwell & Teotl, 2003.) In addition, surgical simulation as well as robotic-assisted surgical procedures will also play an important role in controlling infections. Such approaches minimize incisional length hence the surgical procedure minimizes the contact of tissues with the external environment that usually has potential pathogens. (Abbate et al. 2017.)

2.4 Nursing interventions for the prevention surgical wound infection

2.4.1 Preoperative Interventions

Preoperative nursing interventions play a vital role in minimizing the probability of surgical wound infections (SWIs). These interventions aim to optimize patients' preparation both physiologically and psychologically for the surgical procedure, thereby ensuring that all potential infection risks are addressed before the surgery. (Darouiche et al. 2010.)

Patient education is providing patients with information regarding the significance of preoperative hygiene and compliance with medical guidelines is a critical preventive strategy. Patients are typically guided on effective skin preparation methods utilizing antiseptic solutions, which help reduce the microbial presence on the skin. Additionally, nurses emphasize the necessity of avoiding shaving the surgical site before the operation, as this action may lead to minor skin abrasions that increase the risk of infection. (Mitchell et al. 2017.)

Skin antisepsis is one of the most fundamental steps in prevention SWIs is preoperative skin preparation. This entails applying the surgical site in antiseptic solutions, such as povidone-iodine or chlorhexidine. According to studies, chlorhexidine is linked to a lower incidence of superficial wound infections (SWIs) and is more effective than povidone-iodine at reducing bacterial colonization on the skin. (Darouiche et al. 2010.)

Antibiotic Prophylaxis are another crucial preoperative measure is the timely administration of prophylactic antibiotics. To ensure proper tissue concentrations during surgery and reduce the risk of infection, these antibiotics are usually administered no later than one hour before the incision. To ensure that antibiotics are given according to established guidelines and at the appropriate time and dosage, nurses are instrumental. (Bratzler et al. 2013.)

2.4.2 Intraoperative interventions

The primary objectives of intraoperative nursing interventions are to preserve the surgical wound's sterility and to safeguard it throughout the procedure. To prevent pathogens from entering the surgical site, these interventions are crucial. Sterile field maintenance, when performing surgery, it is crucial to keep the surgical field sterile. This ensures that everyone participating in the surgery follows strict aseptic procedures and utilizes sterile drapes, gowns, gloves, and instruments. To prevent contamination, nurses monitor the sterile field and ensure that any violations in sterility are immediately addressed. (AORN. 2017.)

Techniques for wound protection: Various techniques are used during surgery to prevent contamination of the surgical wound. For example, the edges of the incision can be protected from potentially contaminated objects or surfaces by using flexible plastic devices called wound edge protectors. Furthermore, eliminating debris and reducing the bacterial load at the surgical site can be accomplished with the use of sterile wound irrigation solutions. (Mangram et al. 1999.)

2.4.3 Postoperative care

Postoperative nursing care emphasizes the importance of monitoring and managing the surgical wound to prevent infections and facilitate healing. This stage of care is critical as the patient transitions from the acute surgical environment to the recovery phase. Dressing management is proper management of wound dressings is essential during the postoperative period. Nurses are responsible for replacing dressings at appropriate intervals while employing aseptic techniques to avoid contamination. The selection of dressing materials is also significant; for instance, utilizing antimicrobial dressings can offer enhanced protection against infections. (Dumville et al. 2016.)

Wound surveillance is an ongoing observation of the surgical wound for indicators of infection, such as erythema, edema, heightened pain, or discharge, and is vital for prompt detection and intervention. Nurses are equipped to identify these symptoms and initiate prompt interventions, which may include alerting the surgical team or initiating wound cultures if an infection Patient Instructions: Another important postoperative strategy is teaching patients how to manage their wounds at home. Patients are given instructions on wound care, when to change dressings, and what signs of infection to monitor for. By educating patients, complications that might result in SWIs are avoided and patients are given the confidence to actively participate in their rehabilitation. (Bergstrom et al. 2016.) Nursing interventions during postoperative care are crucial in preventing surgical wound infections (SWIs) by promoting optimal healing and lowering the risk of complications (Anderson et al. 2014).

3 Purpose, aims, and research question.

The purpose of this study is to describe the nursing interventions for preventing surgical wound infections in acute care settings.

The study aims to produce new knowledge on evidence-based nursing practices, collaborative approaches, and advanced wound care technologies for preventing surgical wound infections in acute care settings, based on existing research.

Study Questions

1. What are the nursing interventions to prevent surgical wound infections in acute care settings?

2. How do interventions prevent surgical wound infection in acute care settings?

4 Methodology and methods

A qualitative research approach has been used in this study as a method of comprehending and describing in depth, the object of interest which in this case is the effect of nursing interventions on surgical wound infection (SWI) prevention in acute care settings. This is because qualitative research is most appropriate for studying and exploring phenomena through an understanding of their qualities or natures, such as practices, behaviors, or interventions. Thus, a descriptive literature review will be conducted to synthesize previous studies and evidence about nursing interventions designed to prevent SWIs. (Tuomi & Sarajärvi 2018.)

Descriptive literature reviews are conducted at different phases of the research process. They are frequently carried out to provide a comprehensive overview of the body of knowledge already known about a particular subject at the outset of a research project. This aids in understanding what has previously been investigated and identifies gaps in the body of literature that can be filled. To provide new researchers or practitioners with an overview of a broad field of study, descriptive reviews can also be beneficial. When it is necessary to compile and present the results of previous research in a clear and structured manner, such as for policymaking, education, or to inform practice in a particular field, descriptive reviews are conducted.

4.1 Data collection methods

A descriptive literature review will be conducted so that the existing knowledge on the topic can be summarized and synthesized, with a focus on identifying research trends, evaluating study quality, and highlighting gaps in the literature. This method is highly valuable for assessing the current state of research and studying reliability and thus offering an overview of

nursing interventions aimed at preventing surgical wound infections. In this way, the review will account for available research and critically examine their validity and effectiveness. (Stolt, Axelin & Suhonen, 2016.)

Several key phases constitute the review process: first collecting relevant literature from reliable databases; then synthesizing the findings into a cohesive narrative. In the end, it will involve analyzing their quality and relevance to ensure that only high-quality research is included. Executing this step is vital because it serves as a basis upon which one can measure how effective nursing interventions are and whether findings would carry significance.

4.2 Data search and selection process

PICo is employed in systematic research to design the search and to define the study questions used in the research. It helps to create a valid data searching plan to obtain specific answers through the scoping when using a set of three or four components. (Frandsen & Nielsen & Lindhardt & Eriksen 2020: 1-3.) The PICo applied for this bachelor's thesis comprises three stages. These are 1) P, population which is Nurses practicing in acute care settings 2) I, the interest which is Prevention of surgical wound infections via nursing interventions and 3) Co, context, in which there are patients with surgical wounds.

Table 1. The PICo was created for this bachelor's thesis.

Population (P)		**Interest (I)**		**Context (Co)**
Nurses		Infection Prevention		Acute Care Setting
OR		**OR**		**OR**
Health care workers	**AND**	Surgical Wound Care	**AND**	Hospital Setting
OR		**OR**		**OR**
Nursing Staff		Pre-Operative / Post Operative Wound Care		Operation Room

The data used in this bachelor's thesis was systematically collected from databases by employing various terms and keywords to search for research results. To obtain specific infor-

mation with greater efficiency, Boolean techniques were used, which encompassed the operators AND and OR. Additional tools that were employed in the search are truncation, to encompass all forms of the searched word in a search, and phrases, which connect paired terms. (Stolt et al. 2016: 36-41.)

Our search sentences are,

("surgical wound" or "incision" or "postoperative wound") AND ("infection prevention" Or "Infection control") AND ("acute care setting" or hospital)

The search sentence was used to find data from two databases, CINAHL and PubMed. The database search on CINAHL resulted in a total of n=81 hits, from which n=35 articles were included based on the title of the studies. These n=35 articles were screened on the abstract level which led to n=18 articles being selected by reading the abstract. Then we screened based on Full-text articles for eligibility n=8. Then full-text articles are excluded after reading based on inclusion and exclusion criteria n = 4. Finally, n=4 articles were included after reading the whole text of the articles. The database search on PubMed resulted in a total of n=197 hits, we exclude the n=1 Duplicate article. After that 196 articles were screened, and we selected n=47 articles based on the title. These n=47 articles were read on the abstract level which led to n=28 articles being chosen by reading the abstract. Then we screened based on the Full-text article for eligibility n=13. The full-text articles were excluded after reading based on inclusion and exclusion criteria n = 5 and excluded after verifying the level of clarification of publication of the article from Julkaisufoorumi (JUFO) n 2. Finally, n=6 article was included after reading the whole text of the articles from PubMed.

Exclusion criteria and limiters are used to leave out unnecessary information from the search results (Stolt & Axelin & Suhonen 2016: 57). Precisely set exclusion and inclusion criteria enhance the validity of the literature review, as the criteria narrow the number of studies that might be irrelevant for the systematic review (Mikkonen & Kääriäinen 2020: 106).

Articles published more than ten years ago were excluded from this bachelor's thesis. Instead, articles published from 2014 to 2024 were included. Articles published in languages other than English or Finnish were excluded from this bachelor's thesis. As mentioned above, this research is about preventing wound infection, but this bachelor's thesis focuses only on the surgical wound perspective. Therefore, articles that focus on acute traumatic wounds or chronic wounds were excluded. Also, articles that focused on pediatric patients were excluded

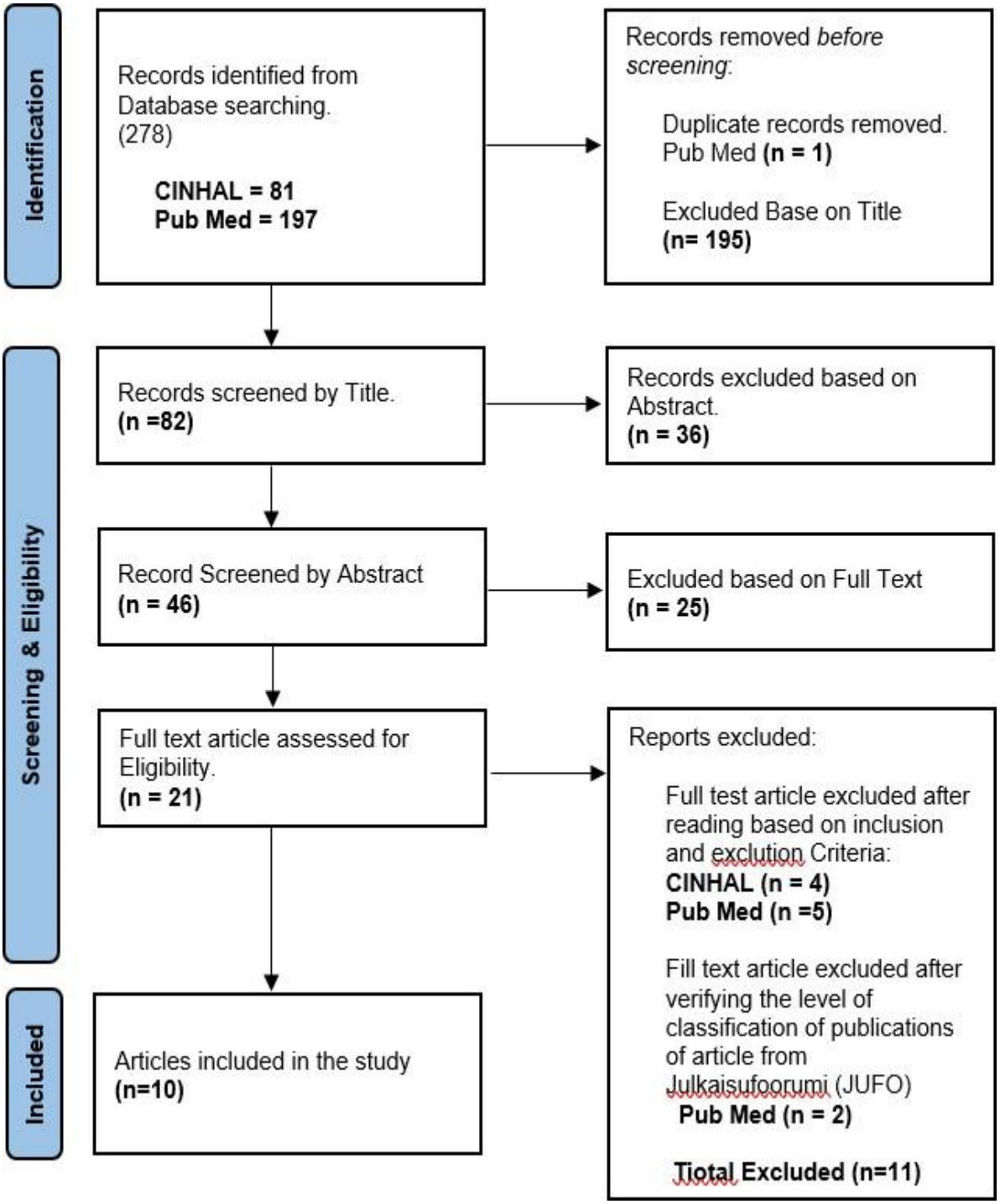
meaning that only articles focusing on adult patients were included. Articles that were reviewed, not nursing scientific, or not peer-reviewed were excluded in the data selection. Below can be seen the inclusion and exclusion criteria used in this bachelor's thesis in table form.

Table 2. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
English language studies	Non-English studies
Studies from 2014 to 2024	Studies published before 2014
Adult patients	Pediatric patients and adolescent patients
Surgical wound	Non-Surgical wound
Primary studies, Nursing scientific studies, peer-reviewed studies	Reviews, non- nursing scientific studies, non-peer-reviewed studies, literature reviews, other thesis/pro gradus
Concerns or includes nursing interventions	Does not include concern or include nursing interventions

The PRISMA flow diagram is an important part of the process of selecting studies for systematic reviews as it adds clarity and methodological strength to the reviews. According to Stolt, Axelin, and Suhonen (2016), this diagram provides a graphical representation of the entire process of review starting with the first phase which is Identification where relevant studies are fetched from different databases and other resources. The next is Screening, where the title and abstract are scanned to remove any unnecessary studies. In the next phase, a full textual appraisal of the articles is conducted about their specified inclusion and exclusion criteria. Lastly, in the Inclusion phase, the studies that pass all the criteria are included in the final review. A PRISMA flow chart gives a clear and ordered method of selection of studies eligible for inclusion in a review, thus promoting reproducibility and record-keeping as far as the processes that have taken place during the review are concerned. This has been accepted

in nursing research practice due to its results as evidenced in the earlier reviews and has improved the reliability and accuracy of the research outcomes. Below can be seen the PRISMA flow chart which reports the data selection used in this bachelor's thesis. (Stolt et al. 2016.)



4.3 Data analysis methods

In this thesis, the authors are taking a research inductive approach toward the content of the collected data based on the literature review, which will be analyzed using qualitative content analysis. Inductive content analysis is usually applied to qualitative studies in which several categories or themes must be developed from the data without any dependence on pre-existing theories or frameworks. (Elo & Kyngäs, 2008.) The approach is relevant to the present study because it examines how nursing care can help in curbing surgical wound infections (SWIs) in the acute care setting by allowing the analysis of the data itself to speak out the patterns and connections existing in the phenomenon.

Inductive content analysis starts with open coding where the respective research papers are read and some concepts concerning nursing interventions and SWI prevention are recognized and given codes. These are often the first codes and tend to be descriptive and express the content of the data. (Graneheim & Lundman. 2004.) For instance, the codes may include related activities such as sterile dressing changes, and preoperative skin preparation among others. At this stage, the investigator is methodologically to all themes and concepts that may emerge to protect the integrity of the coding process throughout the research which is based on data rather than presumptions by the researchers.

When open coding is finished, the following phase includes clustering related codes into wider classes. This means that the data are structured in a manner that notices similarities between the studies. For example, codes concerning infection control measures can be classified under the general category of “preventive measures.” This grouping strategy serves to minimize the amount of data collected and helps in the identification of some relationships that exist in the entire body of literature. (Elo et al. 2014.)

After that, the categories are adjusted and organized during the abstraction process, which is when overarching themes are given based on the literature findings. In this portion of the study, categories are less diverse and classified into more ambitious themes that address the major components of nursing practices directed toward the prevention of surgical wound infections. (Hsieh & Shannon. 2005.) For example, arrangements like "nurse education and training" or "nurse involvement in the patient’s wound care" can be created amongst these themes.

Inductive content analysis also stresses the need for thoroughness and validity of the findings in the research process. To protect the integrity of the findings, the methods of selecting and coding the data will be done in an orderly and open manner. Only articles that fit the criteria for inclusion, such as primary studies, and peer-reviewed articles addressing nursing interventions in acute care settings, will be considered for the review. This helps maintain the integrity and focus of the data subjected to analysis through culling unfit studies. (Graneheim & Lundman, 2004.)

Additionally, studies retrieved from databases such as CINAHL and PubMed are proven to be scientific and empirical studies. Quite right, being from the databases does not mean that the quality is guaranteed hence every article will be assessed for its quality concerning the methodology used before it is incorporated for the analysis. Such a selection of evidence ensures that findings that are relevant and can be used in the prevention of SWIs in nursing are developed. (Elo & Kyngäs, 2008.)

The goal of this thesis, using inductive content analysis, is to describe and analyze the body of knowledge and evidence on nursing practices aimed at the prevention of surgical wound infections in acute care units. This approach accomplishes not only the organization of the data analytic process but also guarantees that results emerge from the ground as they ought to be in practice. (Graneheim & Lundman, 2004.)

Table 3. Example of Content Analysis Table

Meaning Unit	Coding	Subcategory	Generic Category	Main Category
Regular cleaning and disinfection of the OR environment, including surfaces and air filtration, to reduce pathogen presence. Preparing the patient's skin with antiseptic agents to reduce skin flora. Preoperative hair removal to reduce microbial load without causing skin abrasions. **(Xiufang Tang et al. 2022 Page No: 4-7)**	Disinfection of the OR environment.	OR environment Cleaning and disinfection.	Maintain sterile environment.	Intervention for prevention of acute wound infection
	Preparing the patient's skin.	Patient's skin preparation using antiseptic.	Preoperative patient preparation	Intervention for prevention of acute wound infection
	Preoperative hair removal.	Patient's hair shaving.	Preoperative patient preparation	Intervention for prevention of acute wound infection.

5 Result

In this bachelor's thesis, eight research articles were used to answer the research questions: "What are the nursing interventions to prevent surgical wound infections in acute care settings? How the interventions for are prevention of surgical wound infections in acute care settings?" There are ten (n=10) articles that were selected after the data search. All articles were from different countries in the research chosen articles, China (Xiufang,T. et al. 2022), UK (Melissa, R. et.al. 2020), the USA (Frances, L. et.al. 2020), Bangladesh (Humaun, K. et al. 2017), India (Anveshi, N. et.al.2023), Bangladesh (Irfan, A. et.al. 2018), Sweeden (Maria, Q. et.al.2019), UK (Barnaby, C.R. et.al.2019), Sweeden (Camilla, W. et.al.2021
), Brazil (Adriana,C. Et.al.2017). In the research of chosen articles, two studies used qualitative methods, four studies used quantitative, and four used mixed methods.

These articles were analyzed using inductive content analysis. Subsequently, 20 sub-categories, 11 generic categories, and two main categories were created in the inductive analysis. Two main categories are 1) Intervention for Infection prevention of acute wound infection which resulted from Seven generic categories and 14 sub-categories and 2) How do the intervention prevent acute wound infection? which was created from Four generic categories and 06 sub-categories. These categories and results can be seen below in Figure 2 and 3.

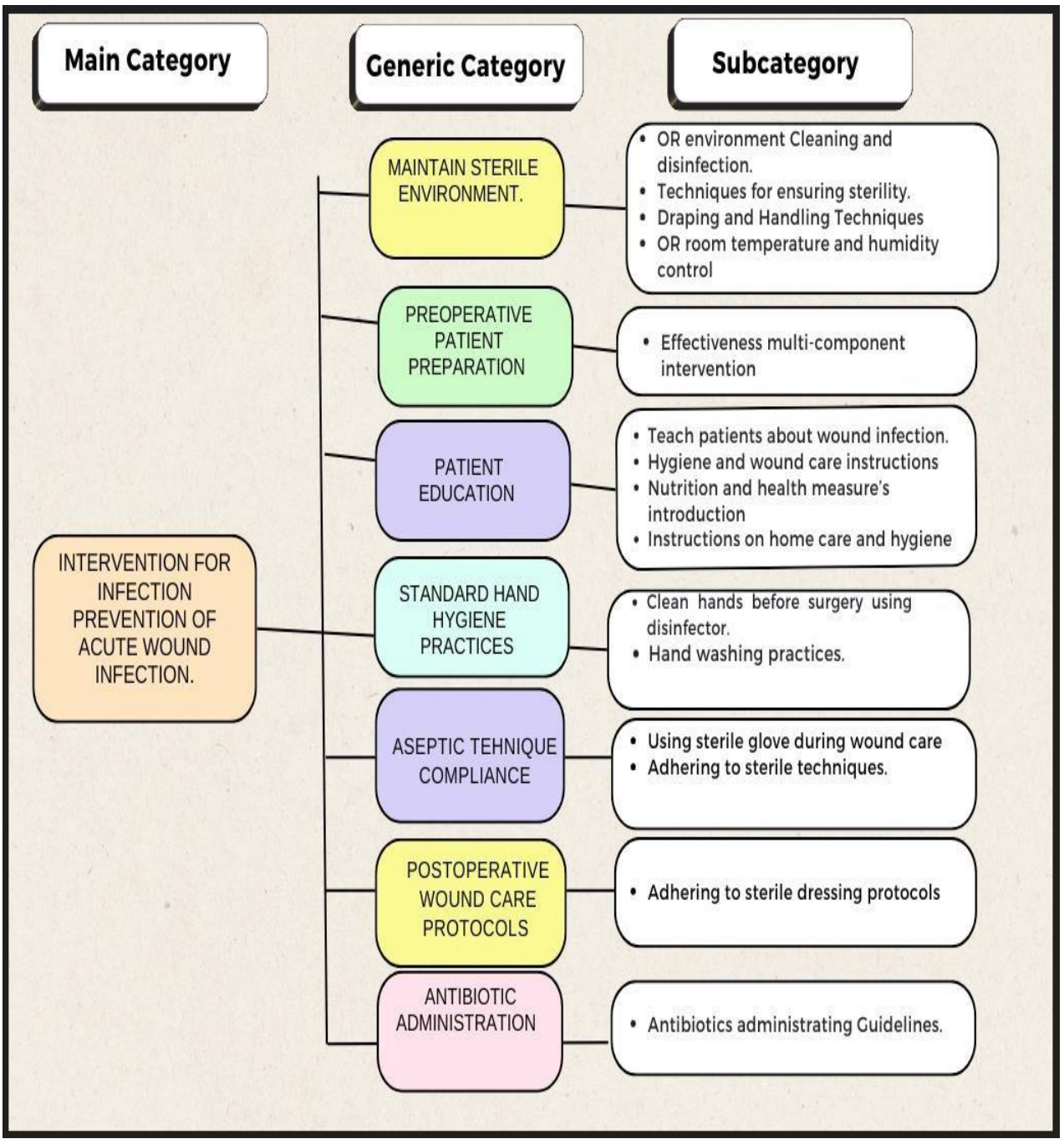


Figure 02 Result of Intervention for Infection prevention of acute wound infection

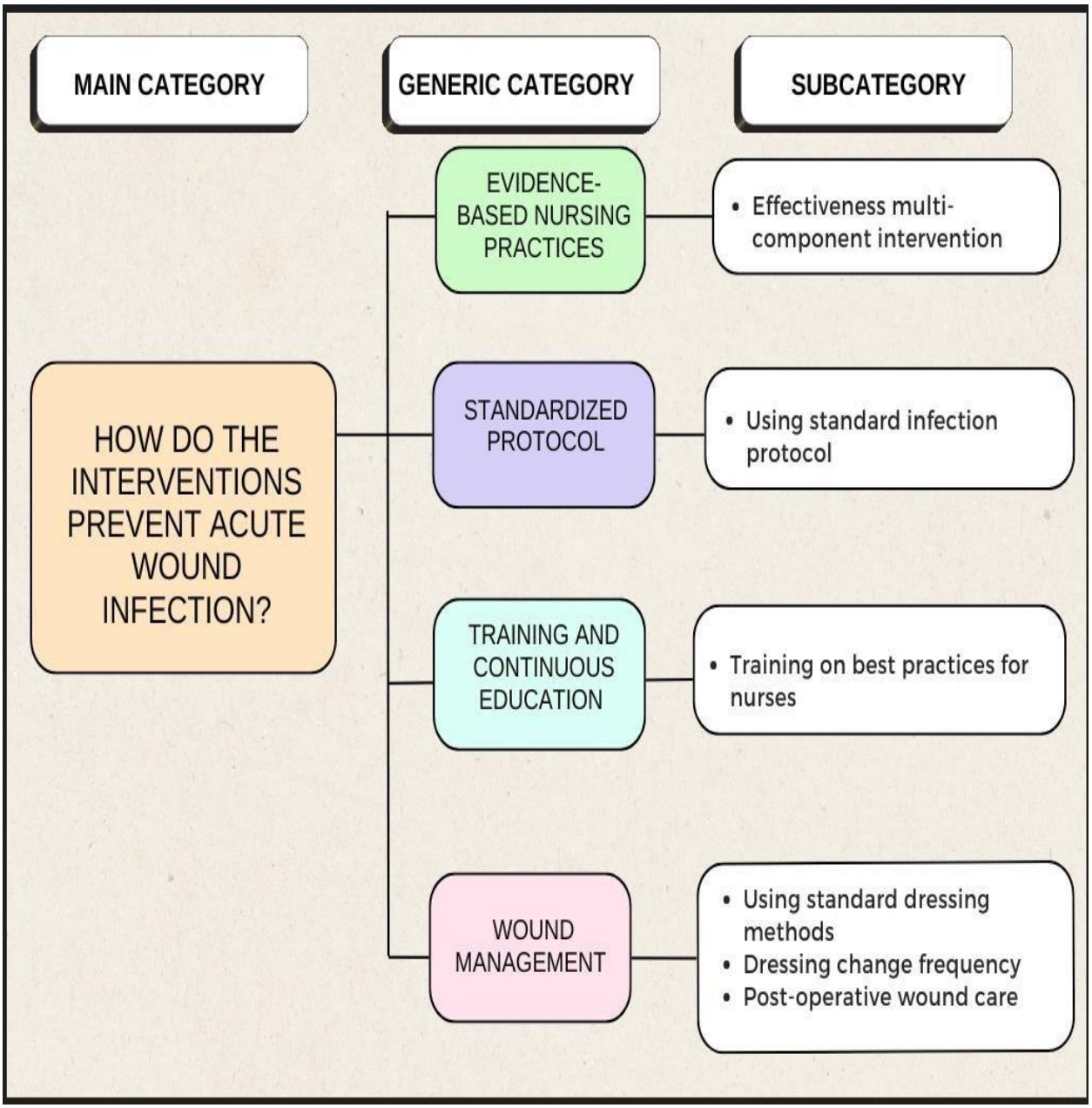


Figure 03 Result of How do the interventions prevent acute wound infection?

5.1 Nursing interventions to prevent surgical wound infections.

Surgical wound infection preventative measures rely heavily on nursing interventions that concentrate on educating the patient, hands, and the surrounding parts of the patient while maintaining asepsis, preparing the skin, and observing hand hygiene practices. Nurses provide proper patient care at every step and ensure that infection prevention measures using P.P.E., and enforcement of compliance are observed. Even in resource-poor settings, such practices

are modified as she or he uses them to empower the patient, preserve sterility, and mostly reduce infection rates, making it safer to carry out surgeries.

5.1.1 Maintain sterile environment

The importance of maintaining a sterile operating room cannot be understood if the objective is to prevent surgical site infections (SSIs). It is the responsibility of the nurse to ensure that all surgical instruments, drapes, and items are properly sterilized to maintain the sterile environment and free from contamination during the procedures. (Tang et al. 2020.) During a surgical procedure, they also control factors such as air and personnel flows that are critical for maintaining a sterile environment. Every person or object brought into the operating and treatment room poses a risk because it contains particles that can be transported in the air, and thus the control of traffic with the use of HEPA filters and positive pressure ventilation is essential to prevent any airborne bacteria from landing on the surgical field. (Sickder et al. 2021.) Even in resource-limited conditions where some equipment may be absent, the fundamental sterilizing practices when followed to the latter can significantly reduce SSI rate. Nurses adapt their practice to fit the circumstances in which they operate, maximizing available resources. This underscores their essential role in infection prevention in such environments. (Nayan et al. 2022.)

5.1.2 Preoperative patient preparation

It is common knowledge that the role of nurses in preparing patients for the surgical procedures also helps to prevent the occurrence of surgical site infections by reducing the risk of microbial penetration into the patient's skin. Such preparation incorporates factors like educating the patients on the proper hygienic practices and disinfecting the affected site using agents such as chlorhexidine or iodine which reduce the skin's microbial load. (Tang et al. 2020.) Patients are taught to promote sanitation practices to increase their awareness and compliance as it has been effective, more so for elective surgeries like cardiac surgery where compliance is essential. Patients are taught how to carry out preoperative hygienic measures including taking an antiseptic shower and or activities that could compromise skin integrity such as hair removal at the operation site, and this further eliminates the chances of infection (Rochon et al. 2021). In such resource-poor settings, nurses play an instructional role, equipping patients with relevant information about infections and compliance with preoperative measures despite limited resources (Nayan et al. 2022).

5.1.3 Patient education

Ensuring patient education is critical as it enables patients to take accountability for their care and thus, reduce the chances of surgical site infections (SSIs). Nurses provide preoperative hygiene instruction, for example, the use of antiseptic showers or washes before the operation. According to Rochon et al. (2021). the effect of these measures on skin bacterial colonization is particularly significant for patients who undergo to have high-risk surgeries such as cardiac procedures, and hence, it will be taught to such patients undergoing surgery as a measure against infections.

Likewise, in other circumstances, as in peripheral areas, most of the patients may be uninformed of infection precautions. According to Nayan et al. (2022). It is also important to inform people about how to perform proper hand hygiene and how to maintain the sterility of the surgical site. This is because it fosters personal accountability and significantly contributes to reducing the spread of infection.

Within the scope of infection control, hand hygiene is central to prevention. Nurses are educated on how to perform surgical hand scrubbing and thoroughly adhere to the principles of hand hygienic protocols. According to Sickder et al. (2021). Strict hand hygiene practices are critical in surgical settings to avoid contamination. Most studies show that greater adherence to hand hygiene results in a reduction in the SSIs especially in low resource settings such as Bangladesh.

5.1.4 Aseptic technique compliance

Adhering to the aseptic technique is imperative in preventing infection in any surgical procedure. Nurses are educated on appropriate protocols which include, hand hygiene, donning of sterile gloves, and adherence to the proper positioning of surgical drapes, within which germs are prevented from entering the surgical site. tang et al. (2020.) Surgical hand antisepsis- the process of scrubbing hands prior to donning sterile gloves carries critical significance in minimizing cross-contamination between healthcare workers and their patients. This is also a state of sterility in which a higher degree of awareness is required in situations involving outer coverings like gloves or gowns. If any one of these barriers is breached, the respective barrier will be changed immediately to protect the integrity of the sterile field. (Sickder et al. 2021.)

The degree of adherence to aseptic techniques over a period is mainly dependent on ongoing training and assessment of nursing staff. Periodic compliance checks promote adherence and correct practice, especially resource-constrained environments that may encourage creative solutions such as in the practice of asepsis. (Lin et al. 2020, Nayan et al. 2022.) For example, in remote health care facilities, nurses would utilize whatever is available on hand without breaking the tenets of asepsis.

Apart from the operating theatre nurses also have significant responsibilities regarding maintaining asepsis after the procedure is complete where they are involved in dressing the wounds with sterile dressings and performing wound care using sterilized instruments. This is vital in recovery as it prevents contamination thus reducing the chances of infections substantially. (Tang et al. 2020.)

5.1.5 Postoperative Wound Care Protocols

After completion of surgery, nurses perform wound evaluations and at the same time change the dressings using sterile technique. In Tang et al. (2020), the relevance of observing and recording practices aimed at the recognition of early signs of infection, such as erythema or discharge is discussed; these are within the critical postoperative phase. Moreover, Oliveira & Gama (2020) state that patient education on wound care such as providing written instruction and follow up care can improve adherence and further prevent complications related to infections.

5.1.6 Antibiotic Administration

Dosing prophylactic antibiotics before surgery is an essential nursing intervention that has to be performed within the prescribed timeframe. Research shows that the risk of surgical site infections decreases significantly when antibiotics are administered within a certain period before the surgical procedure. It is the responsibility of the nurse to ensure these medications are administered as prescribed by the protocol. (Ashraf et al. 2021, Qvistgaard et al. 2020.)

5.2 Implementation of Nursing Interventions

The implementation of nursing actions for the prevention of surgical wound infection is the process of applying the best practices on a routing basis and involves patients. This includes the information given to the patients concerning pre- and postoperative cleanliness, preparation of the skin with antiseptics, hand hygiene, execution of the surgical procedure, and so on without violating sterility, among others. Substantial attention is also directed to the appropriate timing of prophylactic antibiotics administration with the nurse monitoring the patient's wound after the operation. Strengthening adherence of these measures is determined by regular audits and feedback, ensuring that such interventions are always undertaken to reduce the incidence of infection. These practices in turn help the nurses in the integration of these protocols into routine care so that surgical patients remain protected from avoidable infections and healthcare is enhanced.

5.2.1 Evidence based Nursing Practice

Nursing interventions guided by evidence are vital in reducing surgical wound infections (SWIs) by reducing bacterial contamination. Some of the measures include the practice of proper hand hygiene, wearing gloves and gowns, and preoperative cleaning of the patients' skin with disinfectants like chlorhexidine, which helps in reducing the risk of infection for a significant period. (Tang et al. 2020, Rochon et al. 2021.) These measures aim at reducing the introduction of pathogens at the surgical site and the overall bacterial burden on the surgical field, which is a major factor contributing to the occurrence of surgical site infections (SSIs). Adherence to these protocols guarantees that the quality of care is aligned with current standards per the clinical practice guidelines even in resource limited settings. where some aspects of care must be modified. (Nayan et al. 2022.)

5.2.2 Standardized Protocols

The implementation of infection control measures, which is based on research evidence, guides nursing interventions at every stage of the surgical process. There is a need for uniformity in the aseptic techniques used in surgery to prevent significant variability in the quality of care provided, especially in areas where acute care is provided to many patients at once. (Lin et al. 2020.)

Infection control measures that are standardized provide a structured approach for infection control in most or all settings, particularly acute care settings. These measures describe nursing care that covers all phases of surgical interventions, starting from the preparation of the skin before the operation and extending to the care of the surgical wound. As noted by Tang et al. (2020) the advantage of standardization is emphasized when resources are scarce since every procedure is performed in the most effectives manner to reduce the risk of infections even when resources are limited.

5.2.3 Training and Continuous Education

Consistent training schedules help to keep the nursing personnel proficient at infection control measures. This approach also includes regular and systematic updates on information regarding the current research and best practices on infection control, in line with Rochon et al. (2021) findings. Hands-on training sessions enhance the skills required for proper hand hygiene techniques, performing sterile techniques, and teaching patients.

5.2.4 Wound Management

Another important strategy in the prevention of SWIs involves managing the wounds. Nurses make sure that the wound is protected from environmental exposure by dressing the wound with sterile dressing and changing it at regular intervals under aseptic conditions. Cleansing the wound with sterile water also helps in maintaining the sterile wound bed and eliminating any bacterial residue that promotes healing. (Tang et al. 2020.) Moreover, teaching patients how to care for their wounds, including how to identify signs of infection, enhances their recovery especially when assessing healthcare is intermittent (Nayan et al. 2022). All these strategies work hand in hand to avert SSIs and consequently enhance surgical care across various practices (Lin et al. 2020, Sickder et al. 2021).

6 Discussion

The discussion section of this thesis delves into how the results contribute to the existing body of knowledge regarding nursing interventions for preventing surgical wound infections (SWIs) in acute care settings. By analyzing the findings within the context of the literature, this section explores the implications, significance, and potential applications of the study while suggesting areas for future research. It has been established in this research that the previously available literature on SWI prevention and its related causes underestimates the significance of nursing

activities, including creating and maintaining a surgical sterile field, preoperative preparation of patients, educating patients, strictly adhering of aseptic technique, postoperative or surgical site wound management, and administering antibiotics as prescribed. These types of intervention are not only derived from an exhaustive content analysis of all available literature on these issues, but also the recommendations from institutions such as the American Center for Disease Control and Prevention or World Health Organization which further substantiate that these measures are universally applicable. For example, a source of a 'paradigm shift' or 'evidence-based medicine' where all reviewed materials ensure that issues of sterility and the use of aseptic techniques were addressed as a essential component in reducing the risks associated with surgery by all intervention measures in practice and theoretical work as documented by Mangram et al. (1999.) The present research corroborates, in accordance with previously available evidence, the fact that to reduce the prevalence of such superficial infections, particularly the wound incurred after surgery, the antiseptic, chlorhexidine should be extensively employed in preoperative skin preparation (Darouiche et al. 2010).

This research supports the current understanding of SWI prevention in that it validates the importance of nursing measures such as the integrity of a sterile environment, the preparation of the patient prior to surgery, the education of the patient, diligent adherence to aseptic technique, caring for the surgical site after surgery, and administering antibiotics appropriately. These categories result from critical content analysis of world research and are in alignment with policies such as that of the CDC and WHO, demonstrating that these approaches have equal applicability everywhere. For instance, throughout all the articles, the need for maintenance of sterility and aseptic techniques was highly prioritized, and this was supported by literature reporting the effectiveness of these measures in mitigating SWI as reported by Mangram et al (1999). This investigation corroborates the previously gathered data which indicates that when skin preparation is done prior to the surgery, the skin antiseptic chlorhexidine shows more effectiveness in prevention of infections of the superficial tissues (Darouiche et al., 2010).

Moving on to evidence-based practice in nursing and to its corresponding standards of care/ protocols; the findings suggest that structured methods of controlling infections are essential as they have been shown in previous studies that encourage methodical interventions (Anderson et al, 2014). Additionally, the significance of education, training, and strategies on wound care management were further confirmed, showing how regular updates and new skills, practiced, leads to provision of quality services in patients. This agrees with Flynn et al. (2016) who argued that there is requirement of education that is interdisciplinary and simulation-focused to be able to use nursing skills effectively in prevention of infection.

The study provides an additional perspective to the strategies that nurses use and the challenges they encounter in Memsource-constrained settings. Many articles described how nurses tailored infection control measures when there were, constraints feature that is rarely addressed in regions with high adherence to standards. That element extends the scope of effective prevention of SSI by showing that most if not all strategies must be adapted to context-specific circumstances) a view also shared by Griffiths et al. (2016). Further, this study highlights the role of patient education as a tool for empowerment minimizing complications and active involvement of patients in their own care; hence creating avenues for prevention that can be sustained.

The present study presents a significant drawback of current literature: the application of nurse-led administrative interventions needs to be investigated in longitudinal studies over time and in various health systems. Additionally, future research must look at the role of new technologies and how they will fit into the prevention of SWI's. For example, it seems that greater focus on and careful evaluation of context-situational innovative skills will elevate the current practice of nursing interventions around the world.

The present literature review reinforces the critical nursing measures in preventing surgical site infections within acute care environments. From the overview of the evidence, the effective prevention of surgical wound infections (SWI) is a complex interaction with many components; in this case, nursing activities are performed according to evidence-based policies, regular training, patient instructions as well as the practice of cleanliness and sterility. When it comes to acute care situations, where the threat of infection is typically high, these measures are effective in improving the patient's health by decreasing the chances of infections post-surgery.

The results also indicate the need for flexibility, especially in low-income countries, where the practice of the nurses must be altered due to various limitations beyond their control but still remain focused on controlling infection. Nursing interventions, within protocols, through education and training of professionals and patients, can assist in the amelioration of the SWI in all levels of health care.

In the future, the studies may assess how the impact of certain measures differs based on available resources and seek further measures that will be developed in such contexts. Consequently, the dissertation emphasizes [[are positive patient outcomes in acute care, thus making sure that the prevention of SWI is included in the content of nursing care and infection control policies.

6.1 Research ethics and validity of the study

In accordance with ethical principles, ethical researchers always keep their word since research and sharing personal information complete for their interest. If a person supplies his or her body for scientific purposes, they must use it because he/she might fall under suspicion of not following rules outlined by the institution or government. Hence, ethical considerations become more significant in healthcare research involving patient outcomes and clinical interventions. (Faden et al. 1986.)

Ethical approval from an Institutional Review Board (IRB) or similar ethical committee is a mandatory step in healthcare research. The IRB determines whether the study design, data handling, and methods are ethically correct. Hence, in this case, the IRB will conduct a review of the research to ensure that risks posed to participants like interview stress or analysis of private clinical information are minimized while there is more potential benefit in conducting such studies than harm. (Brown et al.2020.)

Also, this study must aim at avoiding bias. In studying the effectiveness of nursing interventions researchers should be aware not to create any biases at all. For example, it might be better for them not to include outcomes with only positive results or emphasize certain elements of their data excessively because otherwise such findings can become distorted and lead to inaccurate conclusions. (Patel & Green, 2020.) To maintain an ethical balance in research, scientists must show their results openly and accept both successes and limitations.

To ensure the credibility of this literature-based study, the research will measure the effectiveness of nursing interventions in preventing surgical wound infections (SWIs) in acute care settings. Validity refers to the accuracy of measurement for which the study is intended and reliability as well as the relevance of results achieved. Generally, validity can be categorized into two forms: internal validity and external validity. (Heale & Twycross 2015.)

Internal validity will be ensured in this literature review by adopting a systematic and comprehensive approach in data collection. All articles for inclusion in this review should be peer-reviewed primary research with distinct methodologies aligned to research questions. Furthermore, it is important to evaluate thoroughly validated tools that were used in original studies like standardized protocols for surgical care or infection measurements to justify that these

reflect the effectiveness of nursing interventions regarding SWI reduction. In addition, selecting studies reporting on these variables or controlling them within their analysis will help counteract potential confounding factors like patient comorbidities or variations in surgical techniques. (Davis & Clark 2022.)

This will allow for a broader generalization of the findings because it will include studies from a wide variety of acute care settings and diverse patient populations that will improve external validity. For instance, results may be applicable across various types of hospitals, geographical locations, and patient demographics; therefore, healthcare environments including low-resource settings can make use of this finding. Thus, this wider scope makes it likely that these conclusions can also apply to other contexts beyond those initially studied. (Miller et al. 2021.)

Reliability consideration requires systematic selection and evaluation of these studies to have consistency and reliability in their findings. However, within the selected studies' data collection methods such as adherence to established protocols on SWI rates measurement will be critically evaluated for their uniformity and reduce variability to contain standardization. As a result, reliable outcomes will only come from studies with clear and consistent data collection methods. Additionally, the inclusion criteria will emphasize peer-reviewed scientific articles published during the last five years to reflect contemporary nursing practice as well as evidence-based interventions. (Williams & Taylor 2019.)

In conclusion, the study follows ethical principles by honoring the integrity of the original research papers, attempting to avoid any form of plagiarism, and giving accurate references for all sources used. There will be no direct contact with patients or conducting interviews; thus, the study does not involve informed consent or patient confidentiality concerns. Ethically, this literature review will receive approval from relevant academic or institutional bodies where necessary to ensure adherence to academic standards in secondary research.

In summary, this research project needs to establish validity through a carefully designed methodology incorporating a literature review that relies primarily on peer-reviewed articles applying standardized data collection procedures. These findings will provide a credible basis for nursing interventions aimed at preventing surgical wound infections in acute care settings thereby enhancing evidence-based practice in nursing.

6.2 Conclusion

The present literature review reinforces the critical nursing measures in preventing surgical site infections within the acute care environments. From the overview of the evidence, the effective prevention of surgical wound infections (SWI) is a complex interaction with many components; in this case, nursing activities are performed according to the evidence-based policies, regular training, patient instructions as well as practice of cleanliness and sterility. When it comes to acute care situations, where the threat of infection is typically high, these measures are effective in improving the patients' health by decreasing the chances of infections post-surgery.

The results also indicate the need for flexibility, especially in low-income countries, where the practice of the nurses has to be altered due to various limitations beyond their control but still remain focused on controlling infection. Nursing interventions, within protocols, through education and training of professionals and patients, can assist in the amelioration of the SWI in all levels of health care.

In the future, the studies may assess how the impact of certain measures differs based on available resources and seek further measures that will be developed in such contexts. Consequently, the dissertation emphasizes the importance of nursing not only in enhancing surgical safety but in ensuring that there are positive patient outcomes in the acute care, thus making sure that the prevention of SWI is included in the content of nursing care and infection control policies.

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Appendix 1. Results from Database Searches

Data-base	Search terms	limit-ers	Num-ber of hits	Se-lected based on title	Se-lected based on ab-stract	Based on whole text
CINAHL	("surgical wound" or "incision" or "post-operative wound") AND ("infection pre-vention" Or "Infec-tion control") AND ("acute care set-ting" or hospital)	Years 2014 - 2024 Eng-lish lan-guage	81	35	18	05
PubMed	Nurse AND("surgi-cal wound" or "in-cision" or "postop-erative wound") AND ("infection pre-vention" Or "Infec-tion control") AND ("acute care set-ting" or hospital)	Years 2014 - 2024 Eng-lish lan-guage	197	42	16	10

Appendix 2. Summary of reviewed articles

Author, year, Country	Topic/Title	Methodology & Methods	Participants	Main Outcomes	Limitations
1. Xiufang Tang et al. 2022 China	The Infection Control Route in the Operating Room Effective-ly Reduces the Wound Infection of Patients	Quantitative, prospective cohort study (Surveys or Questionnaires)	Patients n= 68	The main outcomes of the article "The Infection Control Route in the Operating Room Effectively Reduce the Wound Infection of Patients" likely include a significant reduction in surgical site infection rates after implementing enhanced infection control measures and improved pa-tient outcomes, such as shorter hospital stays and fewer complications. Additionally, the study may assess staff compliance with the new protocols.	Patients without surgical contraindications, aged ≥18 years, and who provided written informed consent were included.

2. Melissa Rochon et.al. 2020 Uk	Implementing enhanced patient education for surgical site infection prevention in cardiac surgery	mixed-methods study	Patients n= 30 - 100	The main outcomes of the article "Implementing Advanced Patient Education for Surgical Site Infection Prevention in Cardiac Surgery" likely include a significant reduction in surgical site infection rates, improved patient knowledge regarding infection prevention, higher compliance with preoperative instructions, and increased patient satisfaction with the education received.	one teaching hospital and two specialist tertiary referral hospitals
3. Frances Lin et.al. 2020 USA	Evaluating the Implementation of a Multi-Component Intervention to Prevent Surgical Site Infection and	Mixed method, Audit / Observation, group/ individual interviews, statistical analyses	Nurses participated in observations n = 20	Nurses can work more efficiently with more instructions and structure. Educational tools increase the understanding of how to proceed with wound care interventions.	Patient who undergoes a mix of surgical procedures including head and neck surgery, urology, gynecology, plastic reconstruction,

	Promote Evidence-Based Practice		Nurses participated in group interviews n = 17 Nurses participated in individual interviews n = 2		maxillary facial, and ear, nose, and throat surgeries
4. Humaun Kabir et al. 2017 Bangladesh	Nurses' Surgical Site Infection Prevention Practices in Bangladesh	Mixed methods Group Interview	Nurses n=450	An assessment of current surgical site infection prevention practices among nurses, evaluation of their knowledge and compliance with protocols, identification of barriers to effective practice, and recommendations for improving infection prevention strategies.	The study was undertaken within three ter-trilevel hospitals in Bangladesh

5. Anveshi Nayan et.al.2023 India	Exploring the Peri-operative Infection Control Practices & incidence of Surgical Site In-fections in rural In-dia	Qualitative, cross-sectional study (Surveys and Questionnaires)	Surgeons n=17 Patients n = 287 (from 5 Hospitals)	An evaluation of current periop-erative infection control prac-tices, the incidence rates of sur-gical site infections (SSIs) in rural healthcare settings, identification of factors contributing to SSIs, and recommendations for im-proving infection prevention strat-egies in the surgical context.	Only surgeons and their hospitals from Indi-an rural and semi-urban regions
6. Irfan Ash-raf et.al. 2018 Bangladesh	Surgical site infec-tion surveillance following total knee arthroplasty: Tertiary care hos-pital experience	Quantitative, pro-spective observa-tional study	Patients = 164	The incidence rates of surgical site infections (SSIs) after total knee arthroplasty, identification of risk factors associated with SSIs, and evaluation of the effec-tiveness of infection prevention protocols im-plemented at the tertiary care hospital.	Only All patients from June 2012 to December 2013 undergoing total knee ar-throplasty at the authors' university tertiary-care hos-pital were included.

7. Maria Qvistgaard et.al.2019 Sweeden	Intraoperative prevention of Surgical Site Infections as experienced by operating room nurses	Qualitative, Interviews or Focus Groups	Nurses n= 15	Identification of effective infection prevention practices used by nurses, barriers to implementing these practices, the impact of training on knowledge, and recommendations for improving infection control strategies in the operating room.	Only 15 nurses with at least one year of clinical experience from seven hospitals participate in this interview study.
8. Barnaby C Reeves et.al.2019 UK	Three wound-dressing strategies to reduce surgical site infection after abdominal surgery: the Bluebelle feasibility study and pilot RCT	mixed-methods approach quantitative RCT data with qualitative research (e.g., interviews with patients and clinicians)	Patients n= 727	The main outcomes of the Bluebelle study indicated that conducting a multicenter RCT on wound-dressing strategies is feasible. Although there were no significant differences in SSI prevention between the dressing strategies, the study provided valuable insights into the trial process, including recruitment and adherence challenges. It	The Bluebelle feasibility study faced several limitations: its small sample size, inherent to its nature as a pilot study, restricted the ability to draw definitive conclusions about the efficacy or effectiveness of the wound-dressing strategies. Additionally, variability in

				also highlighted the need for further investigation into the cost-effectiveness of the strategies and the long-term impact on wound healing	surgical and wound management practices across participating centers could have influenced the consistency of the results. Lastly, the short follow-up period limited the study's ability to evaluate long-term outcomes related to surgical site infections and wound healing
9. Camilla Wistrand et.al.2021 Sweeden	Important interventions in the operating room to prevent bacterial contamination and surgical site infections	Qualitative, a web-based cross-sectional survey, incorporating open-ended questions	Nurses n= 890 Surgical specialties n= 11	Nurses identified 12 key interventions to reduce surgical site infections (SSIs), focusing on Infection Control (skin disinfection, aseptic techniques, draping, normothermia), Preventing Indirect Contamination (sterile clothing, hygiene, operating room environ-	The study's limitations include the subjective nature of self-reported data, potential bias in the nurses' responses, and limited generalizability outside Swedish healthcare settings. Furthermore, the sur-

				ment), and Surgical Team Factors (communication and education). While skin disinfection was considered vital, many nurses overestimated its effectiveness, indicating a need for better understanding and training.	vey did not account for observational or experimental validation of the identified practices.
10. Adriana Cristina et.al.2017 Brazil	Surgical site infection prevention: An analysis of compliance with good practice in a teaching hospital	quantitative cross-sectional study	N =116 participants (medical practitioners and other staff)	The main outcomes included a general lack of compliance with key SSI prevention measures, with significant variations in practice across different surgical teams. The study revealed that certain practices, such as hand antisepsis and antibiotic administration, were not consistently followed, which can contribute to an increased risk of SSIs.	Limitations of the study included its cross-sectional design, which limited the ability to assess causality, and the potential bias introduced by observational methods. Additionally, the study was conducted in a single hospital, limiting the generalizability of its findings