

The Role of Operation Room's Nursing Interventions on Surgical Site Infection and Patient Outcomes: A Scoping Review

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Abstract

Operating room nursing interventions play a crucial role in ensuring patient safety and improving surgical outcomes. Surgical site infections (SSIs) remain a significant concern in perioperative care, leading to increased morbidity, extended hospital stays, and higher healthcare costs. The Review aimed to evaluate the Effectiveness of Operating room nursing interventions on Surgical site infection and patient outcomes. PubMed and CINAHL databases were searched, and research meeting criteria were included. Data were identified from all included articles, and themes were developed based on these data. PubMed and CINAHL databases were systematically searched for relevant studies published between 2018 and 2024. This scoping review synthesized evidence on the effectiveness of perioperative nursing interventions in reducing surgical site infections (SSIs) and improving patient outcomes. Thematic analysis was used to extract key intervention strategies, and a rigorous inclusion and exclusion process ensured the selection of high-quality studies. A total of 15 studies were included in the review. Findings indicated that implementing perioperative nursing interventions significantly reduced SSIs and enhanced patient recovery. Perioperative nursing interventions play a critical role in reducing SSIs and improving patient safety. Hospitals should integrate evidence-based nursing practices into surgical protocols to enhance infection prevention and optimize postoperative recovery.

Keywords: Infection, Interventions, Nursing, Operating Room, Outcomes, Patient, Site, and Surgical.

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INTRODUCTION

The goal of operating room nursing interventions is to improve the quality of care, decrease the occurrence of wound infections, speed up the recovery of patients' physical functions, and implement scientific testing and anesthesia techniques. Positive patient communication is also an important part of these interventions, as is good control over medical equipment and disinfection standards (Zhu, and Luo, 2023). In the perioperative period, germs invade the incision and cause surgical-site wound infection. This raises the risk of complications, including incisional hernia and sepsis, lengthens the patient's hospital stay, and puts a heavy emotional and financial strain on them (Yang *et al.*, 2021). Thus, to enhance patient outcomes and well-being, it is imperative to promptly execute clinical

measures aimed at decreasing the occurrence of surgical-site wound infections (Wang, Li, and Zhang, 2024). Although antimicrobials are often used in clinical settings to treat and prevent perioperative infections, they can hurt liver function due to their metabolic load and lack of efficacy in preventing these infections (Zukowska, and Zukowski, 2022; He, and Hai, 2024).

As the perioperative care framework takes shape, nursing interventions play an increasingly important role. The goal of these treatments is to reduce the likelihood of infection and maximize the likelihood of a successful recovery after surgery (Wang, Zou, and Zhang, 2022). The range of nursing interventions is broad and includes many things, such as strict aseptic procedures, careful wound care, close observation for

early indications of infection, and teaching patients how to manage their wounds and maintain good hygiene after they leave the hospital (International, 2023). Operating room nurse intervention is a practice based on patient-centered, contemporary nursing principles that are integral to the nursing profession as a whole. It is possible to take the following measures: first, during the nursing period, to address patients' and families' concerns in a timely and effective manner; second, to administer surgical treatment signs; and third, to monitor the patient's awakening from anesthesia after surgery (Qiu, and Huang, 2023;), to improve the administration of the operating room's atmosphere, supplies, and staff; to strictly adhere to the aseptic procedure; to actively collaborate with the surgeon and anesthesiologists (Liu *et al.*, 2022), Postoperative surveillance of anesthesia awakening may also be conducted, along with suitable posture modification, prompt instrument distribution, inquiry about the patient's sensations throughout the surgery, and close monitoring of vital signs (Simmons *et al.*, 2022).

BACKGROUND

Operating room nursing interventions play a crucial role in ensuring patient safety and improving surgical outcomes. Surgical site infections (SSIs) remain a significant concern in perioperative care, leading to increased morbidity, extended hospital stays, and higher healthcare costs. The application of evidence-based nursing interventions in the operating room, such as adherence to aseptic techniques, proper antibiotic prophylaxis, and infection control bundles, has been shown to reduce the incidence of SSIs. Understanding the evolution and implementation of these nursing interventions can provide valuable insights into their effectiveness in preventing SSIs and improving overall patient outcomes.

The Impact of Perioperative Nursing on Surgical Site Infection and Recovery

The prevention of surgical site infections (SSIs) and the promotion of optimal patient recovery are two of the most important responsibilities of perioperative nurses. Perioperative nurses play an important role in reducing the risk of infections and their complications by implementing evidence-based practices. These practices include adhering strictly to aseptic techniques, practicing proper surgical hand hygiene, performing antibiotic prophylaxis promptly, and effectively managing wound care (Chellam Singh, and Arulappan, 2023). Improved surgical outcomes, quicker recovery, and reduced hospital stays are all results of their treatments, which also increase patient safety. Better recovery rates and decreased healthcare costs are the end results of perioperative nurses' tireless efforts to minimize surgical site infections (SSIs) through the continual assessment and implementation of infection control strategies (Sun *et al.*, 2024).

Patients having anesthetic-surgical operations are at higher risk for surgical site infection (SSI), a common consequence of healthcare-associated infections (HAIs) that primarily increases healthcare expenditures, morbidity, and death (Ribeiro *et al.*, 2021). Health care providers, policymakers, the media, and the general public have all taken an interest in SSI prevention efforts because of the harm they may do to patients and healthcare systems. While there are strong findings in some nations, a global objective for the future is to accurately assess the frequencies of this illness type and its economic impact (Lu, and Li, 2024). The nurse's primary responsibilities during the perioperative phase include identifying potential hypothermia risk factors, creating a personalized care plan for the surgical patient, and putting that plan into action using therapies supported by scientific evidence (Yao, Xi, and Duan, 2024).

The Perioperative Nursing Strategies for Reducing Surgical Site Infections

Minimizing surgical site infections (SSIs) and guaranteeing patient safety are key goals of perioperative nursing care. Implementing evidence-based infection control measures, assuring good surgical hand cleanliness, maintaining rigorous aseptic methods, and delivering prompt antibiotic prophylaxis are all part of these efforts (Seidelman, Mantyh, and Anderson, 2023). By keeping an eye on sterilisation procedures, improving perioperative skin preparation, and making sure surgical bundles are adhered to, perioperative nurses significantly reduce the likelihood of infection (Shi *et al.*, 2021). The consistency and efficacy of these preventative procedures are further enhanced by efficient communication and coordination among surgical personnel (Tobiano *et al.*, 2024). Surgical site infections (SSIs), poor patient outcomes, and the high expense of treating postoperative complications can all be greatly reduced if perioperative nurses make these practices a regular part of their work (Mamasdykov, 2023).

There are two types of risk factors for surgical site infections (SSIs) in an operating room setting: those that can be controlled and those that cannot. Factors that may be regulated and maximized by strict standards and training include things like surgical equipment sterilization, adherence to aseptic practices, and the conduct of surgical workers (Rosa, Sposato, and Abbo, 2023). However, there are some aspects of patients' microbiota or unexpected reactions to surgery that are considered uncontrollable variables since they are intrinsic to the patient and cannot be changed during surgery (Calderwood *et al.*, 2023). The importance of the operating room as a setting for the rapid prevention of surgical site infections (SSIs) is the rationale for this study's exclusive emphasis on nursing treatments in this setting (Reese, 2023).

Several controllable variables, including aseptic technique, tool sterilization, and surgical team conduct,

directly impact the risk of infection in the operating room (Rad *et al.*, 2024). The foundation for good surgical outcomes and the prevention of surgical site infections (SSIs) is laid by the procedures and protocols executed in the operating room, while postpartum care is as important (Wainwright, Jakobsen, and Kehlet, 2022). Although existing work focuses on postoperative care strategies to minimize the incidence of surgical site infections (SSIs), this study highlights the possibility of tailored nurse interventions at this point to accomplish the same or even more (Rao *et al.*, 2021).

Enhancing Surgical Outcomes through Evidence-Based Nursing Interventions

Improving surgical outcomes by reducing complications and promoting speedier recovery is impossible without evidence-based nursing treatments. Important methods implemented by perioperative nurses include keeping the operating room clean, making sure the patient's skin is ready for surgery, and giving antibiotics at the correct times (Lv and Yang, 2021). In addition, the risk of surgical site infections can be greatly reduced by closely monitoring patients, recognizing infection symptoms early on, and following best practices for wound care (Ye *et al.*, 2025). Improving patient safety and contributing to reduced hospital stays and healthcare costs are both achieved via the integration of interdisciplinary teamwork and procedures supported by research. Surgical success rates and patient care quality are both improved when evidence-based nursing practices are prioritized (Laing *et al.*, 2022). Perioperative nurse interventions are just as important as the surgical procedure's technical expertise when it comes to the effectiveness of surgical therapy. Consequently, it is critical to prioritize enhancing the standard of nursing care in operating rooms to achieve the best possible clinical results (Madden, and Bhandari, 2020)

Traditional nurse interventions in the operating room (OR) tend to adhere to a predetermined routine, which could be lacking in individuality and flexibility. Basic preoperative teaching, regular monitoring during surgery, and standard postoperative care are common components of these therapies (Iyngkaran *et al.*, 2022). Their unique psychological health, personal risk factors, and possible repercussions are just a few examples of how TBI patients' unique demands and complexities may be unmet. This shows how conventional methods have their limits, as they can cause ineffective risk management and less-than-ideal recovery results (Newsome, 2023).

It is imperative to implement evidence-based solutions due to the shortcomings of traditional operating room nursing treatments, such as inadequate risk assessment and an absence of individualized care. There has to be an improvement in nursing practices since these constraints can lead to more postoperative problems and longer recovery periods (Qi, and Li, 2025). However, a

more personalized approach is made possible by evidence-based medicine (EBM) -optimized nursing treatments, which combine clinical practice with the most recent scientific findings (Yang *et al.*, 2021). According to Wolfhagen *et al.* (2022), patients with traumatic brain injuries (TBIs) require thorough evaluations before surgery, tailored psychosocial and cognitive support throughout the procedure, and careful attention before and after the operation to address their specific needs. Within this framework, the use of EBM presents a fresh outlook on boosting operating room nursing. To enhance patient outcomes and quality of life, EBM emphasizes integrating the most recent scientific findings with clinical practice. This involves systematic evaluation, design, and implementation of treatments (Liosatos, Tobiano, and Gillespie, 2024).

AIM: This study aims to evaluate the effectiveness of operating room nursing interventions in reducing surgical site infections (SSIs) and improving patient outcomes. By analyzing the impact of evidence-based perioperative nursing practices, such as aseptic techniques, antibiotic prophylaxis, surgical hand hygiene, and infection control measures, the study seeks to identify best practices that enhance patient safety and recovery. The findings will contribute to optimizing perioperative nursing protocols, minimizing postoperative complications, and promoting better surgical outcomes.

METHOD

To evaluate the effectiveness of operating room nursing interventions on surgical site infections (SSIs) and patient outcomes, researchers conducted a comprehensive scoping literature review. A rigorous inclusion and exclusion process was applied to ensure a representative selection of high-quality studies, minimizing bias in the findings (Mohamed *et al.*, 2022). Multiple databases were systematically searched using predefined criteria to identify relevant articles on perioperative nursing interventions, infection prevention, and surgical outcomes (Cash *et al.*, 2022). Key themes and intervention strategies were extracted, synthesized, and analyzed through thematic analysis to identify best practices in reducing SSIs and enhancing patient recovery. Each selected study was reviewed multiple times to detect patterns, verify consistency in outcomes, and ensure the comprehensiveness of the findings (Ganesha, and Aithal, 2022). This review aims to contribute to nursing knowledge by highlighting the impact of evidence-based perioperative nursing interventions in improving patient safety and surgical outcomes.

Search Strategy

To assess the effectiveness of operating room nursing interventions on surgical site infections (SSIs) and patient outcomes, the authors of this scoping literature review established specific keywords. The search terms were intentionally broad to capture all

relevant studies aligned with the review's objectives. A research librarian assisted in conducting a systematic search across multiple databases. The PubMed database was searched using the terms: "Operating Room Nursing," "Surgical Site Infection Prevention," and "Patient Outcomes." The Cumulative Index to Nursing and Allied Health Literature (CINAHL) database was explored using the terms "Perioperative Nursing Interventions" and "Infection Control." The objective of this search was to identify studies discussing the role of perioperative nursing practices in preventing SSIs and improving postoperative recovery. The search was conducted in 2024 without restrictions on publication dates. A total of 377 articles published between 2018 and 2024 were retrieved through this systematic search.

Search Outcome

A total of 377 studies underwent screening utilizing full-text approaches. Subsequently, 362 studies were eliminated for a variety of reasons: A total of 150 studies did not fulfill the intended research objective, 112 studies did not satisfy the criteria for study design, 82 reviews did not meet the criterion for results, and 4 pieces of research examined the same data. Following the complete examination of the texts, 18 studies were eliminated due to the author's failure to reply to the request for an essential table that was not included in the publication. Ultimately, the research incorporated a total of fifteen papers (as seen in Figure 1) that satisfied the criteria for inclusion.

Quality Appraisal

The included studies were assessed for rigor and trustworthiness through a structured quality evaluation process for this scoping literature review. Various research designs, including quantitative, qualitative, and mixed-methods studies, were evaluated using standardized checklists from organizations such as the Joanna Briggs Institute (JBI) and the Critical Appraisal Skills Program (CASP). These tools guided the appraisal process to ensure methodological soundness and reliability (Lee, and Lim, 2021). Key evaluation criteria included the clarity of research questions, appropriateness of study methodology, sample size and selection process, data collection and analysis techniques, and the relevance of findings to

perioperative nursing interventions for surgical site infection (SSI) prevention and patient outcomes (Flemming, and Noyes, 2021).

To enhance reliability and minimize bias, two independent reviewers conducted the quality assessment, discussing and resolving any discrepancies in the ratings. Studies that failed to meet the minimum quality criteria, such as lacking a clear research focus or exhibiting significant methodological flaws, were excluded from the final analysis (Lukewich *et al.*, 2022). This rigorous quality evaluation process ensured that the review synthesized high-quality evidence, strengthening our understanding of how perioperative nursing interventions can effectively reduce SSIs and enhance postoperative recovery.

Data Abstraction and Synthesis

Throughout this evaluation, matrices were developed to facilitate organization, data analysis, and theme identification. Initially, the studies were categorized based on the databases in which they were found. The first set of matrices included details on study samples, settings, methodologies, and outcomes, allowing for a structured comparison of key elements across the included literature (Alhumaid *et al.*, 2021). These matrices were designed to synthesize data and highlight similarities in research settings, sample characteristics, and methodological approaches. In the second phase, a matrix was created to organize the main sources according to patterns and shared data elements. This matrix served as the foundation for theme development, helping to identify recurring trends in perioperative nursing interventions for surgical site infection (SSI) prevention and patient outcomes. The final matrix captured emerging themes across studies, incorporating supporting evidence to refine and strengthen thematic findings. This structured approach facilitated the identification of commonalities, enhancing the reliability of the thematic synthesis. The final step involved integrating the extracted themes into a cohesive representation of the data, providing new insights into evidence-based perioperative nursing practices and their impact on SSI prevention and patient recovery (Horgan *et al.*, 2023).

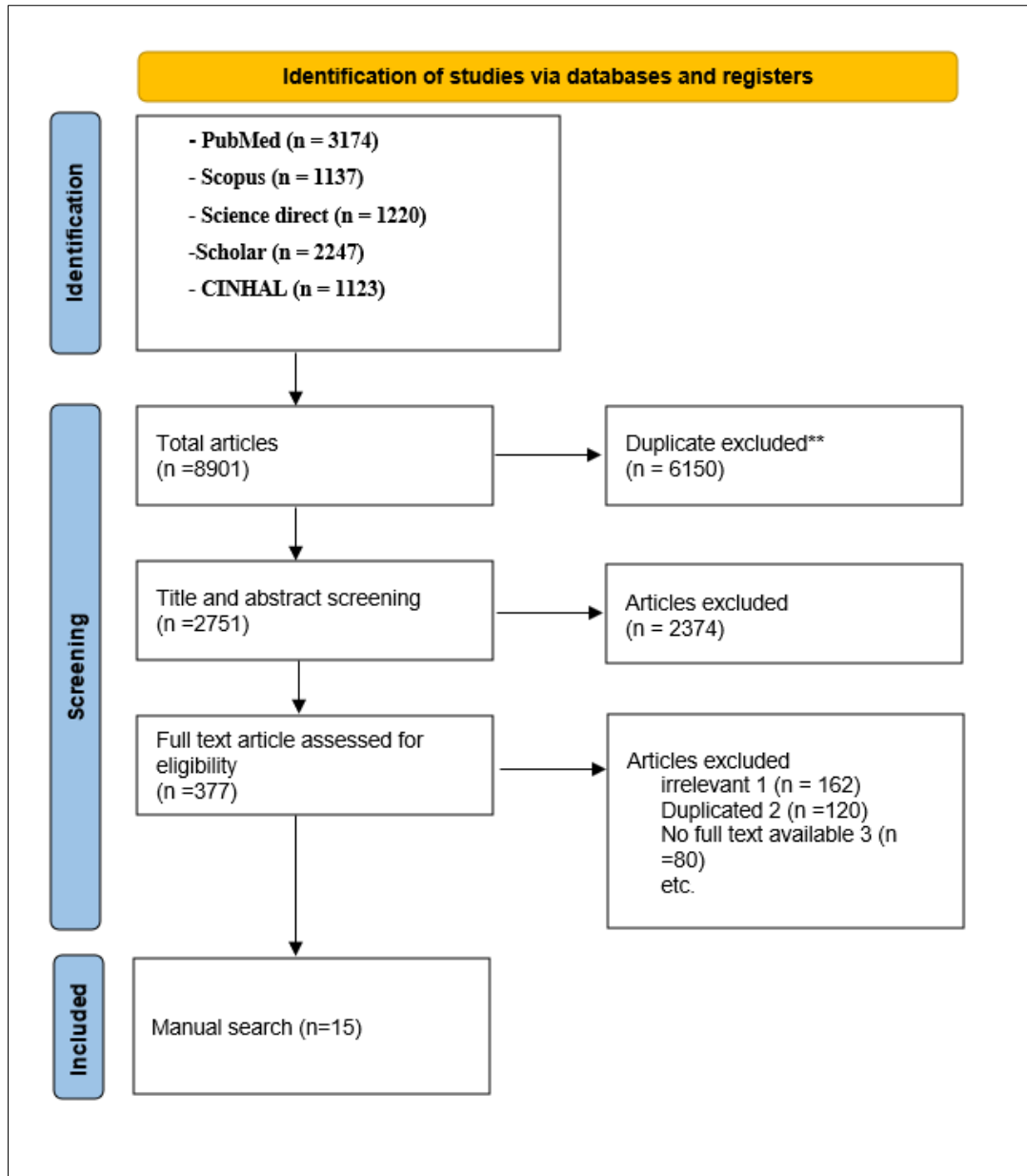


Figure 1: PRISMA flow diagram (PRISMA, 2020)

RESULTS

Samples, Settings, and Methods

The number of participants in the included studies ranged from 6 to 5671. Research in this review included 2 qualitative studies, 6 quantitative studies, and 7 systematic literature reviews (Tables 1–3 provide specific information on methods and other details of the included studies). The countries associated with the articles in this review were Egypt (1), Australia (2), China (7), Turkey (1), Sweden (2), Saudi Arabia (1), Korea (1).

Key Findings

The study aimed to assess the effectiveness of operating room nursing interventions in reducing surgical site infections (SSIs) and improving patient outcomes. Better postoperative recovery and shorter

hospital stays may result from evidence-based nursing practices that considerably lower the incidence of surgical site infections (SSIs). Preoperative skin antisepsis, sterile methods, and antibiotic stewardship are standardized infection control approaches that might improve patient safety, reduce problems, and speed recovery, according to the evaluation. The strategy's focus on proactive nursing interventions led to better surgical outcomes and higher adherence to infection control guidelines by nurses.

The research also revealed that other crucial areas, like wound care management, postoperative monitoring, and early infection identification, have all benefited greatly from organized nursing interventions. Reduced rates of hospital-acquired infections and increased levels of patient satisfaction were two

outcomes of the improved surgical treatment that followed the effective application of evidence-based guidelines (Horgan *et al.*, 2023). Surgical nursing practices have been enhanced by the implementation of infection control standards and ongoing nurse education, leading to more uniform and efficient treatment

(Alhumaid *et al.*, 2021). Taken together, the findings stress the importance of continuing research to enhance nursing tactics for infection control and patient safety and the possibility of nurse-led interventions to revolutionize surgical care (Lukewich *et al.*, 2022).

Table 1: Quantitative Articles

Publication/date/authors	Aims/purpose	Design/methods	Context/setting/sample	Findings
Nyberg <i>et al.</i> , 2024	To explore operating room nurses' safety attitudes and their views on how to improve patient safety in operating rooms	A cross-sectional study	358 operating room nurses Setting: Sweden	With age and expertise came a greater emphasis on safety in this group. There is a need for improvement in operating rooms regarding patient safety, namely with workload and communication.
Pan, and Yi, 2024	To assess the effect of refined management in the operating room nursing on surgical efficiency and nursing satisfaction during laparoscopic radical resection of colon cancer	retrospective study	100 patients with laparoscopic radical resection of colon cancer Setting: China	Improvements in surgical care quality and efficiency, as well as patient satisfaction with nursing staff, can be achieved by the application of a refined management model in the operating room.
Ongun <i>et al.</i> , 2024	to determine the effect of preoperative evidence-based care education given to cardiac surgery clinical nurses on the postoperative recovery of patients	A quasi-experimental study	Eighty-six patients who underwent cardiovascular surgery Setting: Turkey	Patients can safely be cared for using the preoperative evidence-based care list that has been provided.
Rabea <i>et al.</i> , 2022	To evaluate the effect of preoperative and intraoperative nursing intervention on surgical wound infection among surgical patients	A quasi-experimental study	110 adult patients undergoing surgical procedure Setting: Egypt	To avoid surgical wound infections, nurses were able to intervene both before and during the operation.
Bian <i>et al.</i> , 2022	to explore the effect of holistic nursing in operating room based on PDCA (plan, do, check, and action) process and evidence-based nursing (EBN) in a ear, nose, and throat operating room	Retrospective Case-Control Study	200 patients who underwent otorhinolaryngology surgery Setting: China	Patients undergoing ear, nose, and throat surgeries benefit from a comprehensive approach to treatment that incorporates PDCA and (EBN) principles.
Heo, Nam, and Hyun, 2021	tested the effectiveness of brochure- and video-based education on managing surgical site infections by operating room health personnel.	A cross sectional study	34 operating room health personnel were subjected to training on surgical site infection management Setting: Korea	Improving awareness and compliance with surgical site infection care requires the creation and implementation of ongoing, comprehensive educational programs.

Table 2: Systematic review articles

Publication/date/ authors	Aims/purpose	Design/methods	Context/setting/ sample	Findings
Zhu <i>et al.</i> , 2021	to evaluate the effect of ORNI on the psychological status and incidence of emergence agitation in the recovery period of general anesthesia through a systematic review and meta-analysis, thus providing clinical evidence to support it.	systematic review	A total of 20 articles Setting: China	As a result of leftover anesthetics, patients in the recovery phase after general anesthesia may feel impacts on their central nervous system to varied degrees. Awakening symptoms include confusion, agitation of the limbs, and aberrant psychology.
Jarelnape <i>et al.</i> , 2024	to identify the most effective nursing interventions for improving patient outcomes	A systematic review	A total of 6 articles Setting: Saudi Arabia	In general, the review's results show that some nurse interventions in different healthcare contexts have good effects.
Liu, Han, and Su, 2024	To evaluate the effect of continuous nursing on surgical site wound infections and postoperative complications in colorectal cancer (CRC) patients with stomas	A meta-analysis	A total of 20 articles Setting: China	Patients with colorectal cancer (CRC) stomas can greatly benefit from continuous nursing care, which not only improves their quality of life but also reduces the incidence of wound infection and surgical sequelae.
Wang, Li, and Zhang, 2024	to assess the effect of refined nursing interventions in the operating room on the incidence of surgical-site wound infections in patients undergoing lung cancer surgery to provide an evidence base for the prevention and management of nosocomial infections	A meta-analysis	1210 patients in the refined nursing Setting: China	Patients having lung cancer surgery can experience a shorter hospital stay and a lower risk of surgical-site wound infections because to improved nurse interventions implemented in the operating room.
Kumar, and Smith, 2024	To evaluate and synthesise the effectiveness of intra-operative gentamicin in reducing post-operative surgical site infections compared to other irrigating solutions or no irrigation	A systematic review	Eight studies Setting: Australia	When comparing SSI rates between NS and intra-operative gentamicin irrigation, the latter had a lower incidence.
Habtie <i>et al.</i> , 2025	to assess and synthesize the global evidence on the level of nurses' knowledge and its determinants regarding the prevention of surgical site infections.	A comprehensive systematic review and meta-analysis	515 participants Setting: Australia	The results show that people don't know much, which means that there has to be a worldwide push for specific educational initiatives.
He <i>et al.</i> , 2022	to provide scientific management methods to prevent nosocomial	A Meta-Analysis	2962 orthopedic patients Setting: China	Operating room nursing management might lower the incidence of

Publication/date/ authors	Aims/purpose	Design/methods	Context/setting/ sample	Findings
	infection based on the systematical evaluation of the effect of operating room nursing management on nosocomial infection in orthopedic surgery			infection while avoid nosocomial infection in orthopedic surgery, which could be employed to guide the hospital management.

Table 3: Qualitative articles

Publication/date/ authors	Aims/purpose	Design/methods	Context/setting/ sample	Findings
Nyberg <i>et al.</i> , 2021	To explore aspects of patient safety practice during joint replacement surgery through assessment of operating room nurse experiences.	A qualitative study	A total of 21 operating room nurses Setting: Sweden	There is still a need for regular performance attention to the circumstances that promote patient safety or reduce the risk of complications during joint replacement surgery.
Yip <i>et al.</i> , 2025	To explore nurses' experiences with surgical site infection prevention practices in the intraoperative setting	A Qualitative Study	Twenty-one nurses working in clinical settings Setting: China	Problems with collaboration, new information, dialogue, and patient safety were among the many that nurses faced.

Synthesis of Findings**Influence of Operating Room Nursing Practices on Patient Outcomes**

Surgical safety, complication prevention, and expedited recovery are three areas where operating room nursing approaches significantly impact patient outcomes. Wound healing, complication rates, and surgical site infections can all be improved with the use of perioperative nursing treatments such as aseptic technique adherence, correct patient placement, and careful intraoperative monitoring. Central nervous system impacts can impair a patient's recovery and safety after general anesthesia by causing agitation, confusion, and psychological disorders. When it comes to postoperative problems, traditional nursing solutions aren't always the best option and can even increase hazards. Reducing emerging agitation, promoting psychological well-being, and boosting patient recovery are all goals of Operating Room Nursing Interventions (ORNI), an innovative tailored nursing paradigm that integrates preoperative, intraoperative, and postoperative care. Oral rehabilitative nursing improves trust, reduces fear, and speeds up recovery after surgery by combining individualized health education with psychological support and organized follow-up care (Zhu *et al.*, 2021). It is important to consistently pay attention to the factors that promote patient safety or reduce the risk of complications during joint replacement surgery, as they can be inconsistent at times. In cases when potential difficulties to patients are readily apparent, ORNs adapt to address these issues as they emerge. Despite efforts to improve patient safety, organizational processes can permit practitioners to stray from best practices and

instead rely on "bedside" interventions tailored to each patient (Nyberg *et al.*, 2021).

The attitudes of ORNs toward safety were shown to be linked with both age and length of service in the workforce. The ORNs who participated in this survey feel that there is room for development in the areas of communication and workload to guarantee patient safety on the job. Active management and development of the organizational safety climate is necessary to improve and develop patient safety in the operating room. Attempts to hold on to seasoned operating room nurses can be a step toward actively regulating the safety atmosphere (Nyberg *et al.*, 2024). Improvements in patient understanding, self-management, and quality of life are some of the beneficial outcomes that can be expected from patient education programs. Improving patient outcomes is greatly aided by medication management measures. Prescription reconciliation and monitoring programs can improve adherence, decrease adverse drug responses, and decrease prescription mistakes. Better patient outcomes are greatly enhanced by infection control methods. Proper hand hygiene and isolation precautions are two evidence-based infection control techniques that can minimize the occurrence of healthcare-associated illnesses (Jarelnape *et al.*, 2024).

The Relationship between Operating Room Nursing Practices and Patient Recovery

Ensuring surgical safety, minimizing complications, and encouraging healing are three aspects of operating room nursing practices that have a direct influence on patient recovery. Patient posture, infection control, and constant monitoring are all components of

effective perioperative care that decrease the likelihood of surgical complications and lengthen hospital stays. By enhancing resource allocation, optimizing management procedures, and refining work rules, the refined management model greatly improves surgical efficiency and the quality of nursing care in the operating room. Clinical results are improved as a result of enhanced staff coordination, shorter preparation and transfer times, and prompt patient care. In addition to enhancing surgical safety, lowering infection risks, and raising patient satisfaction, improved management also helps medical professionals advance in their careers (Pan, and Yi, 2024). Because they offer normothermia in the time after transfer from the OR to the ICU, decrease the amount of early postoperative pain, number of postoperative complications, and duration of hospital stay, preoperative evidence-based care lists can be safely utilized in nursing practices for patients having cardiac surgery. Consistent with these findings, nurses practicing cardiovascular surgery should refer their patients to an evidence-based care list before surgery, and new studies should be based on this list and similar care bundles (Ongun *et al.*, 2024).

Patients with a CRC stoma can greatly benefit from continuous nursing care, which not only improves their quality of life but also reduces the risk of wound infection and postoperative sequelae. Further study on the problem would be beneficial, as continual nursing interventions greatly enhance patients' quality of life with CRC stomas (Liu, Han, and Su, 2024). Perioperative nurses play a crucial role in minimizing the likelihood of surgical site infections, postoperative problems, and longer hospital stays by their adherence to strict infection control protocols, skillful pain management, and constant intraoperative monitoring. Reducing anxiety, increasing cooperation, and bettering recovery experiences are all goals of patient-centered therapies including psychological support and preoperative education. Recovery periods, patient outcomes, and satisfaction with surgical treatment are all much enhanced when operating room nurses use evidence-based procedures, communicate clearly with surgical teams, and offer holistic care. Increased patient happiness, decreased hospital expenses, shorter recovery times, fewer postoperative infections, and less time spent in the intensive care unit are all outcomes that can be achieved with quality surgical treatment. This combination of nursing treatments is still worth trying out in the real world, even though further randomized controlled trials are required (De Simone *et al.*, 2020; Bian *et al.*, 2022).

The Impact of Operating Room Nursing Interventions on Surgical Site Infection Rates

By promoting rigorous adherence to infection control policies and evidence-based practices, operating room nursing interventions are vital in lowering the prevalence of surgical site infections (SSIs). Reduce your risk of postoperative infections by practicing good

hygiene, using aseptic methods, using antimicrobial prophylaxis as prescribed, and maintaining a sterile field. Effective surgical site infection prevention requires the establishment of collaborative forums for quality improvement, the recognition and value of nurses' skills, and the promotion of solid team structures. In order to guarantee patient safety during the operation, it is crucial to exercise vigilance in preventing infections at surgical sites. This is especially true in light of the growing danger of antibiotic resistance. Minimizing the bacterial burden throughout the surgical environment is an important part of maintaining a high focus on operating room safety. During crucial moments like the COVID-19 pandemic, members of the operating room team need to exchange knowledge and be attentive to one another, as this research emphasizes (Yip *et al.*, 2025). Professional Training on the Management of Surgery Endositis for Surgical Workers. Surgical sinusitis knowledge is untrained after gram application. There has been an uptick in performance and recognition this year, but these metrics are really just training programs. There has already been a peak in the educational program's improvement. Nothing was established. Awareness and performance in the management of surgical sinusitis are higher. A lot of work has to go into measuring and improving (Heo, Nam, and Hyun, 2021).

Surgical site infections (SSIs) are less common when gentamicin is irrigated during surgery instead of afterward. Results were mixed when researchers compared intraoperative gentamicin irrigation to alternative treatments, including diluted PI, a combination of antibiotics, or no irrigation at all. A variety of factors influence how effective gentamicin irrigation is in minimizing SSI, including surgical specialization, patient demographics, gentamicin dosage, volume of dilution, and surgical technique. There has to be standardization of the intraoperative gentamicin irrigation techniques because of the moderate variation across the trials (Kumar, and Smith, 2024). Customized training programs and ongoing professional development for nurses should be healthcare systems' top priorities to improve patient care. Nursing programs may incorporate SSI prevention into their curricula if they incorporate international standards from organizations like the WHO and CDC. Comprehensive evaluation methods, including as hands-on exercises, objective structured clinical exams (OSCEs), and case-based discussions, should supplement this to gauge students' grasp and implementation of SSI prevention strategies. Furthermore, to guarantee successful teaching and mentoring, nursing educators should undergo training on the most recent ways of preventing SSIs. The worldwide burden of SSIs can be greatly reduced if nursing education incorporates these components so that future nurses have the skills to apply optimal practices (Habtie *et al.*, 2025). Operating room nursing management, including preoperative management, nursing during surgery, and after surgery, can effectively reduce the

infection incidence and increase the patient's nursing satisfaction (He *et al.*, 2022).

Strengths and Limitations

A comprehensive search approach using many databases was employed to guarantee thorough coverage of pertinent literature, hence enhancing the study's validity. Expert input, in conjunction with collaboration with a research librarian, refined the search procedure, while stringent inclusion and exclusion criteria augmented the dependability of the findings. The application of the scoping review technique enabled a systematic synthesis of varied studies, yielding a comprehensive knowledge of the effects of operating room nursing interventions on surgical site infections and patient outcomes. Nonetheless, confining the evaluation to peer-reviewed publications may result in publication bias, and the omission of non-English research might narrow the breadth of insights. Moreover, discrepancies in research methodology and sample sizes between the included studies may influence the generalizability of the findings.

Implications for Practice, Education, and Research

The analysis of the review underscores substantial implications for research, teaching, and clinical practice. Nursing interventions in the operating room are essential for minimizing surgical site infections and enhancing patient outcomes, highlighting the necessity for standardized, evidence-based guidelines. Healthcare organizations have to provide specialized training programs to improve nurses' compliance with infection control protocols and perioperative best practices. Nursing education must incorporate sophisticated infection control measures to equip future nurses for proficient surgical patient care. Additional study is required to evaluate the long-term effects of these therapies on patient recovery, healthcare expenditures, and incidence of hospital-acquired infections, as well as to ascertain obstacles to their uniform use across various surgical environments.

CONCLUSION AND RECOMMENDATIONS

Surgical site infection rates and patient outcomes are considerably affected by nurse interventions in the operating room, according to this scoping research. Reduced infection rates and improved postoperative recovery are outcomes of effective perioperative nursing practices, which include following infection control protocols, practicing adequate surgical hand hygiene, and utilizing wound care treatments based on evidence. To further improve patient outcomes and decrease surgical site infections, future studies should assess the long-term efficacy of targeted nursing treatments. Professional development programs and institutional regulations should be in place to support the constant use of best practices and ensure adherence to infection control measures. Surgical nursing interventions should be optimized through multidisciplinary teamwork, which in turn improves

patient recovery trajectories and creates safer operating rooms.

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