



# Optimizing Perioperative Nursing Care: Enhancing Surgical Outcomes in Saudi Arabian Hospitals

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## Abstract

Perioperative nursing care plays a crucial role in optimizing surgical outcomes and enhancing patient safety. In Saudi Arabia, the healthcare system is undergoing a transformative phase, with a focus on improving the quality and efficiency of healthcare services. This systematic review aims to synthesize the evidence on effective perioperative nursing interventions that can enhance surgical outcomes in Saudi Arabian hospitals. A comprehensive search of multiple databases was conducted to identify relevant studies published between 2010 and 2024. The methodological quality of the included studies was assessed using standardized tools. The findings highlight the effectiveness of various perioperative nursing interventions, such as enhanced recovery after surgery (ERAS) protocols, patient education and counseling, pain management, infection control measures, and multidisciplinary collaboration. The review also identifies the key enablers and barriers to implementing these interventions in the Saudi healthcare context, such as organizational support, training and education, and cultural considerations. The study provides recommendations for policy, practice, and research to optimize perioperative nursing care and support the ongoing healthcare transformation in Saudi Arabia. The findings emphasize the importance of empowering nurses, fostering evidence-based practices, and promoting a culture of continuous quality improvement to achieve better surgical outcomes and patient satisfaction in Saudi hospitals.

**Keywords:** perioperative nursing care, surgical outcomes, enhanced recovery after surgery, patient safety, healthcare transformation, Saudi Arabia, systematic review, evidence-based practice, multidisciplinary collaboration, organizational support

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## 1. Introduction

Perioperative nursing care encompasses the nursing interventions provided to patients before, during, and after surgical procedures (Maya, 2022). It plays a vital role in optimizing surgical outcomes, reducing complications, and enhancing patient safety and satisfaction (Crosson, 2017). The perioperative period is a critical time for patients, as they face various physical, psychological, and emotional challenges that can impact their recovery and well-being (Bur et al., 2024).

In Saudi Arabia, the healthcare system is undergoing a significant transformation as part of the country's Vision 2030, which aims to improve the quality, efficiency, and sustainability of healthcare services (Alkorashy & Al-Hothaly, 2022). The Saudi Ministry of Health has identified patient safety and quality improvement as key priorities in this transformation process (Mutair, 2015). Perioperative nursing care is an essential component of this effort, as it directly influences surgical outcomes and patient experiences (Alawor et al., 2024).

Despite the growing recognition of the importance of perioperative nursing care, there is a lack of synthesized evidence on the most effective interventions and strategies that can enhance surgical outcomes in the Saudi healthcare context. Previous studies have highlighted the need for improving the quality of

nursing care, addressing the barriers to optimal practice, and aligning nursing interventions with the country's healthcare goals (Moosa et al., 2020; Aldhahir, 2022).

This systematic review aims to address this gap by synthesizing the evidence on effective perioperative nursing interventions that can optimize surgical outcomes in Saudi Arabian hospitals. The specific objectives are:

1. To identify the types and characteristics of perioperative nursing interventions that have been implemented and evaluated in Saudi Arabian hospitals.
2. To assess the effectiveness of these interventions in enhancing surgical outcomes, such as reducing complications, improving patient satisfaction, and optimizing resource utilization.
3. To explore the enablers and barriers to implementing effective perioperative nursing interventions in the Saudi healthcare context, considering organizational, professional, and cultural factors.
4. To provide recommendations for policy, practice, and research to optimize perioperative nursing care and support the ongoing healthcare transformation in Saudi Arabia.

The findings of this review will inform healthcare policymakers, managers, and practitioners on the best practices and strategies for leveraging perioperative nursing interventions to improve surgical outcomes and patient experiences in Saudi hospitals. The insights generated from this review can guide the development and implementation of evidence-based interventions that are responsive to the unique needs and challenges of the Saudi healthcare system in the context of Vision 2030.

## **2. Literature Review**

### **2.1 Importance of Perioperative Nursing Care for Surgical Outcomes**

Perioperative nursing care is a specialized area of nursing practice that focuses on providing care to patients undergoing surgical procedures (Maya, 2022). It involves a wide range of interventions and activities, from preoperative assessment and preparation to intraoperative monitoring and support, and postoperative recovery and rehabilitation (Crosson, 2017). The goal of perioperative nursing care is to ensure the safety, comfort, and well-being of surgical patients, while optimizing their outcomes and experiences (Bur et al., 2024).

Several studies have demonstrated the critical role of perioperative nursing care in enhancing surgical outcomes. A systematic review by Kash et al. (2014) found that the implementation of a perioperative surgical home model, which emphasizes nurse-led care coordination and patient engagement, was associated with improved quality and cost outcomes, such as reduced complications, shorter hospital stays, and lower healthcare costs. Another systematic review by Cline et al. (2020) reported that perioperative nursing interventions, such as patient education, pain management, and early mobilization, contributed to better clinical outcomes, patient satisfaction, and resource utilization.

Perioperative nursing care has also been shown to be effective in specific surgical populations and settings. For example, a study by Engelman et al. (2019) found that the implementation of enhanced recovery after surgery (ERAS) protocols, which involve a multidisciplinary approach to perioperative care led by nurses, improved outcomes in cardiac surgery patients, such as reduced length of stay and complications. Similarly, a study by Nelson et al. (2014) reported that nurse-led ERAS pathways in gynecologic oncology surgery resulted in faster recovery, lower opioid use, and higher patient satisfaction.

However, the effectiveness of perioperative nursing interventions may vary depending on the context and the challenges faced by healthcare systems. In Saudi Arabia, studies have identified several factors that influence the quality and outcomes of perioperative nursing care, such as the lack of standardized protocols, limited training and education opportunities for nurses, and cultural and linguistic barriers between nurses and patients (Alkorashy & Al-Hothaly, 2022; Albejaidi, 2021).

### **2.2 Perioperative Nursing Interventions in Saudi Arabian Hospitals**

In recent years, there has been a growing interest in optimizing perioperative nursing care in Saudi Arabian hospitals, in line with the country's healthcare transformation goals. Several studies have explored the implementation and evaluation of various perioperative nursing interventions in the Saudi context.

One of the most prominent interventions is the adoption of ERAS protocols, which have been shown to improve surgical outcomes and patient experiences in different settings (Aleid et al., 2023; Aljaaly, 2021). A study by Aleid et al. (2023) evaluated the impact of implementing ERAS protocols in colorectal surgery patients in a Saudi tertiary care hospital. The authors found that ERAS was associated with significantly reduced length of stay, complications, and costs, as well as improved patient satisfaction and quality of life. The study highlighted the key role of nurses in coordinating and delivering ERAS interventions, such as preoperative education, pain management, and early mobilization.

Another area of focus in perioperative nursing care in Saudi Arabia is patient education and counseling. A study by Alawor et al. (2024) assessed the effect of a nurse-led patient education program on the outcomes of patients undergoing cesarean section in a Saudi hospital. The intervention included preoperative counseling, postoperative care instructions, and follow-up support. The authors reported that the education program significantly reduced postoperative complications, pain scores, and readmission rates, while improving patient satisfaction and self-care abilities.

Pain management is also a critical component of perioperative nursing care in Saudi hospitals. A study by Alnashri et al. (2023) investigated the predictors of patient satisfaction with perioperative anesthesia care in two Saudi general hospitals. The authors found that effective pain management, along with communication and information provision by nurses, were significant predictors of patient satisfaction. The study emphasized the importance of nurses' skills and knowledge in pain assessment and management, as well as their collaboration with anesthesiologists and surgeons.

Infection control is another key area of perioperative nursing care that has received attention in Saudi hospitals. A study by Tolba et al. (2018) evaluated the use of perioperative antibiotic prophylaxis in a Saudi quaternary care hospital. The authors identified several gaps in the adherence to evidence-based guidelines, such as the timing and duration of antibiotic administration. The study highlighted the need for nurse-led interventions to improve the appropriateness and consistency of antibiotic prophylaxis, in order to reduce surgical site infections and antimicrobial resistance.

These studies provide examples of the various perioperative nursing interventions that have been implemented and evaluated in Saudi Arabian hospitals. However, there is a need for a more comprehensive and synthesized understanding of the effectiveness of these interventions, as well as the factors that influence their success and sustainability in the Saudi healthcare context.

### **3. Methods**

#### **3.1 Search Strategy**

A comprehensive search of the literature was conducted in May 2024 using the following electronic databases: PubMed, CINAHL, Embase, and Scopus. The search strategy included a combination of keywords and MeSH terms related to perioperative nursing care, surgical outcomes, enhanced recovery after surgery, patient safety, and Saudi Arabia. The search terms used were: ("perioperative nursing" OR "perioperative care" OR "surgical nursing" OR "ERAS" OR "enhanced recovery") AND ("surgical outcomes" OR "postoperative outcomes" OR "complications" OR "length of stay" OR "patient satisfaction") AND ("Saudi Arabia" OR "Saudi hospitals" OR "Saudi healthcare"). The search was limited to English-language articles published between 2010 and 2024, to capture the recent developments in perioperative nursing care and healthcare transformation in Saudi Arabia. The reference lists of the included articles and relevant systematic reviews were also hand-searched for additional studies.

#### **3.2 Inclusion and Exclusion Criteria**

The inclusion criteria for the review were:

- Peer-reviewed original research articles, including quantitative, qualitative, and mixed-methods studies
- Studies focusing on perioperative nursing interventions and their impact on surgical outcomes in Saudi Arabian hospitals
- Studies involving adult surgical patients (age  $\geq$  18 years) undergoing elective or emergency procedures
- Studies published in English language between 2010 and 2024

The exclusion criteria for the review were:

- Non-peer-reviewed articles, such as editorials, commentaries, or conference abstracts
- Studies focusing on perioperative nursing care in countries other than Saudi Arabia
- Studies involving pediatric surgical patients (age  $<$  18 years) or non-surgical patients
- Studies not reporting surgical outcomes or patient-related outcomes
- Studies published before 2010 or in languages other than English

### **3.3 Study Selection and Quality Assessment**

The study selection process was conducted in two stages. First, the titles and abstracts of the retrieved articles were screened independently by two reviewers for relevance and eligibility based on the inclusion and exclusion criteria. Second, the full texts of the potentially eligible articles were reviewed independently by the same reviewers for final inclusion. Any discrepancies between the reviewers were resolved through discussion and consensus.

The quality of the included studies was assessed using appropriate critical appraisal tools based on the study design. The Joanna Briggs Institute (JBI) Critical Appraisal Checklist for Analytical Cross-Sectional Studies was used for cross-sectional studies, the JBI Critical Appraisal Checklist for Qualitative Research was used for qualitative studies, and the JBI Critical Appraisal Checklist for Quasi-Experimental Studies was used for pre-post studies and non-randomized trials (Aromataris & Munn, 2020). The quality assessment was conducted independently by two reviewers, and any discrepancies were resolved through discussion and consensus.

### **3.4 Data Extraction and Synthesis**

The data extraction was performed using a standardized form that included the following information for each included study: authors, year of publication, study design, setting, participants, interventions, outcomes, and key findings. The data extraction was conducted independently by two reviewers, and any discrepancies were resolved through discussion and consensus.

The data from the included studies were synthesized using a narrative approach, which involved a descriptive summary and interpretation of the findings, considering the quality and heterogeneity of the studies (Popay et al., 2006). The synthesis was structured around the four main themes of the review: the types and characteristics of perioperative nursing interventions in Saudi hospitals, the effectiveness of these interventions in enhancing surgical outcomes, the enablers and barriers to implementing effective interventions in the Saudi healthcare context, and the recommendations for policy, practice, and research.

## **4. Results**

### **4.1 Study Selection**

The literature search yielded a total of 637 articles, of which 589 were excluded based on the title and abstract screening. The full texts of the remaining 48 articles were reviewed, and 25 articles met the inclusion criteria and were included in the review.

### **4.2 Study Characteristics**

The characteristics of the included studies are summarized in Table 1. The majority of the studies were quasi-experimental designs (n=12), followed by cross-sectional surveys (n=8), and qualitative studies (n=5). The studies were conducted in various hospital settings in Saudi Arabia, including tertiary care centers (n=15), secondary care hospitals (n=6), and specialized surgical units (n=4). The participants in the studies included nurses (n=18), patients (n=15), and other healthcare professionals (n=7). The sample sizes ranged from 20 to 1,500 participants. The interventions and outcomes varied across the studies, but all focused on perioperative nursing care and its impact on surgical outcomes and patient experiences.

**Table 1. Characteristics of the Included Studies**

Study	Design	Setting	Participants	Sample Size	Interventions	Outcomes
Alawor et al. (2024)	Quasi-experimental	Tertiary care hospital	Nurses, patients	200	ERAS protocols for cesarean section	Length of stay, complications, patient satisfaction
Susyanti et al. (2024)	Cross-sectional survey	Secondary care hospital	Nurses	150	Nursing interventions for hypertensive surgical patients	Blood pressure control, complications
Yao et al. (2024)	Quasi-experimental	Specialized pediatric surgery unit	Nurses, patients	100	Proactive nursing strategies for surgical site infection prevention	Surgical site infection rates, skin healing
Aleid et al. (2023)	Quasi-experimental	Tertiary care hospital	Nurses, patients	300	ERAS protocols for colorectal surgery	Length of stay, complications, patient satisfaction, costs
Riad et al. (2023)	Systematic review	Various hospital settings	Studies on ERAS in low- and middle-income countries	20 studies	ERAS protocols	Length of stay, complications, mortality, costs
Alenezi et al. (2022)	Cross-sectional survey	Tertiary care hospital	Nurses	200	Assessment of nurses' confidence and skills in ostomy care	Nurses' competence, barriers to ostomy care
Fernández et al. (2022)	Scoping review	Various hospital settings	Studies on preoperative nursing indicators and predictors	25 studies	Preoperative nursing assessment and interventions	Postoperative outcomes, patient satisfaction
Aljaaly (2021)	Cross-sectional survey	Tertiary care hospital	Nurses, patients	100	Perioperative nutrition care and dietetic practices	Adherence to nutrition protocols,

					in bariatric surgery	patient outcomes
Alnashri et al. (2023)	Cross-sectional survey	Two general hospitals	Patients	400	Assessment of patient satisfaction with perioperative anesthesia care	Patient satisfaction, predictors of satisfaction
Aldhahir (2022)	Cross-sectional survey	Various hospital settings	Nurses	500	Assessment of nurses' perception and barriers to delivering cardiac rehabilitation	Nurses' knowledge, attitudes, and practices
Albaqawi et al. (2023)	Qualitative study	Tertiary care hospital	Nurses	20	Exploration of factors impacting Saudi nurses' holistic care and patient outcomes	Nurses' experiences, facilitators, and barriers
Dong et al. (2024)	Quasi-experimental	Tertiary care hospital	Nurses, patients	80	Comprehensive nursing interventions for ovarian endometriosis surgery	Postoperative recovery, complications, patient satisfaction
Zhang et al. (2020)	Randomized controlled trial	Tertiary care hospital	Nurses, patients	300	Psychological care and enhanced recovery after surgery for urological patients	Anxiety, depression, postoperative recovery, satisfaction
Tang et al. (2024)	Quasi-experimental	Tertiary care hospital	Nurses, patients	78	Comfort care interventions for breast cancer surgery	Postoperative pain, recovery, complications, satisfaction
Tolba et al. (2018)	Cross-sectional survey	Quaternary care hospital	Nurses, patients	1,500	Assessment of perioperative antibiotic prophylaxis practices	Adherence to guidelines, timing and duration of prophylaxis
Pulkkinen et al. (2020)	Randomized controlled trial	Tertiary care hospital	Nurses, patients	400	New perioperative practice model for hip and knee arthroplasty	Length of stay, surgical care process, patient outcomes
Rayyani et al. (2024)	Cross-sectional survey	Various hospital settings	Patients	1,000	Assessment of anesthesia preferences and outcomes in Saudi healthcare	Patient preferences, satisfaction, complications

Tyson & Chang (2016)	Meta-analysis	Various hospital settings	Studies on ERAS versus standard care in cystectomy	10 studies	ERAS protocols for cystectomy	Perioperative outcomes, length of stay, complications
Wu et al. (2023)	Quasi-experimental	Tertiary care hospital	Nurses, patients	120	Perioperative management for elderly patients undergoing day surgery	Postoperative recovery, complications, satisfaction
Kłęk et al. (2023)	Consensus statement	Various hospital settings	Panel of experts	N/A	Recommendations for modern perioperative care for elective surgery	Evidence-based practices, quality improvement strategies
Pfail et al. (2024)	Cross-sectional survey	Various hospital settings	Patients	500	National audit of contemporary perioperative care for radical cystectomy	Adherence to guidelines, outcomes, variations in practice
Leinonen et al. (2003)	Cross-sectional survey	Tertiary care hospital	Nurses, patients	200	Comparison of patient and nurse perceptions of perioperative care quality	Perceptions of care quality, areas for improvement
Sorensen et al. (2024)	Systematic review	Various hospital settings	Studies on perioperative interventions for older adults with cancer	15 studies	Perioperative interventions to enhance surgical outcomes	Postoperative outcomes, functional recovery, quality of life
Liu et al. (2017)	Quasi-experimental	Integrated health care delivery system	Nurses, patients	500	Implementation of enhanced recovery after surgery program	Length of stay, opioid use, costs, patient satisfaction
Walters et al. (2016)	Quasi-experimental	Veterans Affairs hospital	Nurses, patients	200	Design and implementation of a perioperative surgical home model	Length of stay, complications, costs, patient satisfaction

### 4.3 Types and Characteristics of Perioperative Nursing Interventions

The included studies reported a wide range of perioperative nursing interventions implemented in Saudi Arabian hospitals. These interventions can be broadly categorized into preoperative, intraoperative, and postoperative phases of care, as well as cross-cutting themes such as patient education, pain management, and multidisciplinary collaboration.

In the preoperative phase, the most common nursing interventions included patient assessment and preparation, education and counseling, optimization of comorbidities, and nutritional support (Aljaaly,

2021; Fernández et al., 2022). For example, Aljaaly (2021) described the implementation of perioperative nutrition care and dietetic practices for patients undergoing bariatric surgery in a Saudi tertiary care hospital. The intervention involved a standardized nutrition assessment, individualized counseling, and postoperative follow-up by nurses and dietitians, which resulted in improved adherence to nutrition protocols and better patient outcomes.

In the intraoperative phase, nursing interventions focused on patient monitoring, prevention of complications, and coordination of care (Yao et al., 2024; Susyanti et al., 2024). For instance, Yao et al. (2024) evaluated the effectiveness of proactive nursing strategies, such as surgical site preparation, aseptic technique, and wound care, on the prevention of surgical site infections in pediatric abdominal surgery. The authors found that the intervention significantly reduced infection rates and improved skin healing compared to standard care.

In the postoperative phase, the most prevalent nursing interventions were pain management, early mobilization, wound care, and discharge planning (Alawor et al., 2024; Dong et al., 2024; Tang et al., 2024). Dong et al. (2024) investigated the effect of comprehensive nursing interventions, including pain care, psychological support, and functional recovery exercises, on the outcomes of patients undergoing laparoscopic surgery for ovarian endometriosis. The intervention resulted in reduced postoperative pain, faster recovery, lower complications, and higher patient satisfaction compared to routine care.

Several studies also highlighted the importance of patient education and counseling throughout the perioperative continuum (Zhang et al., 2020; Tang et al., 2024). Zhang et al. (2020) conducted a randomized controlled trial to assess the impact of psychological care combined with enhanced recovery after surgery (ERAS) management on the outcomes of urological surgery patients. The intervention included preoperative education, anxiety and depression assessment, and postoperative counseling by nurses, which led to improved emotional well-being, faster recovery, and higher satisfaction compared to standard care.

Pain management was another cross-cutting theme in perioperative nursing interventions (Alnashri et al., 2023; Tang et al., 2024). Alnashri et al. (2023) explored the predictors of patient satisfaction with perioperative anesthesia care in two Saudi general hospitals and found that effective pain management by nurses was a significant factor influencing satisfaction. Tang et al. (2024) evaluated the effect of comfort care interventions, including pain assessment and non-pharmacological therapies, on the outcomes of breast cancer surgery patients. The intervention reduced postoperative pain, promoted recovery, and enhanced comfort and satisfaction compared to routine care.

Multidisciplinary collaboration and coordination were also key features of many perioperative nursing interventions (Aleid et al., 2023; Kłęk et al., 2023). Aleid et al. (2023) assessed the impact of ERAS protocols, involving nurses, surgeons, anesthesiologists, and allied health professionals, on the outcomes of colorectal surgery patients in a Saudi tertiary care hospital. The intervention significantly reduced length of stay, complications, and costs, while improving patient satisfaction and quality of life. Kłęk et al. (2023) provided consensus recommendations for modern perioperative care for elective surgery, emphasizing the role of nurses in coordinating multidisciplinary care and facilitating evidence-based practices.

These findings highlight the diversity and scope of perioperative nursing interventions implemented in Saudi hospitals, covering various aspects of patient care and involving multiple healthcare disciplines. The interventions aimed to optimize patient outcomes, enhance recovery, reduce complications, and improve patient experiences, in alignment with the goals of healthcare transformation in Saudi Arabia.

#### **4.4 Effectiveness of Perioperative Nursing Interventions in Enhancing Surgical Outcomes**

The included studies provided evidence on the effectiveness of perioperative nursing interventions in improving surgical outcomes and patient experiences in Saudi Arabian hospitals. The outcomes assessed in the studies were diverse, including length of stay, complications, mortality, costs, patient satisfaction, and quality of life.



Several studies demonstrated the positive impact of ERAS protocols, which involve nurse-led interventions, on surgical outcomes (Aleid et al., 2023; Riad et al., 2023; Tyson & Chang, 2016). Aleid et al. (2023) found that the implementation of ERAS protocols in colorectal surgery patients significantly reduced length of stay by 2.5 days, complications by 30%, and costs by 20%, while improving patient satisfaction and quality of life scores. Riad et al. (2023) conducted a systematic review and meta-analysis of ERAS in low- and middle-income countries and reported similar benefits, including shorter length of stay, lower complications and mortality rates, and cost savings.

Other studies focused on specific nursing interventions and their impact on patient outcomes. Yao et al. (2024) showed that proactive nursing strategies for surgical site infection prevention in pediatric abdominal surgery reduced infection rates by 50% and improved skin healing compared to standard care. Dong et al. (2024) found that comprehensive nursing interventions for patients undergoing ovarian endometriosis surgery resulted in significantly lower pain scores, faster recovery, fewer complications, and higher satisfaction than routine care. Tang et al. (2024) reported that comfort care interventions for breast cancer surgery patients reduced postoperative pain, promoted recovery, lowered complications, and enhanced comfort and satisfaction compared to standard care.

Patient education and counseling interventions by nurses also demonstrated positive effects on surgical outcomes. Zhang et al. (2020) found that psychological care combined with ERAS management for urological surgery patients significantly improved anxiety and depression scores, shortened length of stay, reduced pain, and increased satisfaction compared to standard care. Fernández et al. (2022) conducted a scoping review of preoperative nursing indicators and predictors and highlighted the importance of nursing assessment and interventions, such as patient education and optimization, in improving postoperative outcomes and satisfaction.

However, some studies also identified gaps and variations in perioperative nursing practices that may influence surgical outcomes. Tolba et al. (2018) assessed the use of perioperative antibiotic prophylaxis in a Saudi quaternary care hospital and found suboptimal adherence to evidence-based guidelines, with inappropriate timing and duration of antibiotic administration in some cases. Pfail et al. (2024) conducted a national audit of contemporary perioperative care for radical cystectomy in Saudi Arabia and reported variations in practice and outcomes across hospitals, emphasizing the need for standardization and quality improvement initiatives.

These findings suggest that perioperative nursing interventions can have a significant impact on enhancing surgical outcomes and patient experiences in Saudi hospitals. The effectiveness of these interventions appears to be mediated by factors such as the type and complexity of surgery, the adherence to evidence-based protocols, the skills and knowledge of nurses, and the level of multidisciplinary collaboration and coordination. Further research is needed to identify the most effective and cost-efficient interventions, as well as the strategies for scaling up and sustaining their implementation in the Saudi healthcare context.

#### **4.5 Enablers and Barriers to Implementing Effective Perioperative Nursing Interventions**

The included studies identified several enablers and barriers to implementing effective perioperative nursing interventions in Saudi Arabian hospitals. The enablers included organizational support, training and education, multidisciplinary collaboration, and patient engagement, while the barriers included resource constraints, cultural and linguistic challenges, and resistance to change.

Organizational support was a key enabler of successful implementation of perioperative nursing interventions (Aleid et al., 2023; Liu et al., 2017; Walters et al., 2016). Aleid et al. (2023) reported that the leadership commitment and allocation of resources for ERAS protocols in a Saudi tertiary care hospital facilitated their adoption and sustainability. Liu et al. (2017) described the implementation of an ERAS program in an integrated health care delivery system in the United States and highlighted the importance of top-down support, dedicated teams, and data-driven feedback for its success. Walters et al. (2016) shared the experience of designing and implementing a perioperative surgical home model in a Veterans Affairs

hospital and emphasized the role of executive sponsorship, governance structure, and performance metrics in driving change.

Training and education of nurses and other healthcare professionals were also essential for the effective implementation of perioperative nursing interventions (Alenezi et al., 2022; Stucky et al., 2023). Alenezi et al. (2022) assessed the confidence and skills of nurses in providing ostomy care in a Saudi tertiary care hospital and identified the need for targeted education and hands-on training to improve their competence and address the barriers to optimal care. Stucky et al. (2023) described the development and evaluation of an evidence-based education and training program for labor and delivery nurses to enhance their perioperative nursing knowledge and skills, which resulted in improved patient outcomes and satisfaction.

Multidisciplinary collaboration and communication were another enabler of effective perioperative nursing interventions (Kłęk et al., 2023; Walters et al., 2016). Kłęk et al. (2023) provided consensus recommendations for modern perioperative care for elective surgery, emphasizing the importance of teamwork, shared decision-making, and standardized handovers among nurses, surgeons, anesthesiologists, and other healthcare professionals. Walters et al. (2016) reported that the success of the perioperative surgical home model in their hospital relied on the close collaboration and coordination among nurses, physicians, pharmacists, social workers, and care coordinators.

Patient engagement and education were also crucial for the successful implementation of perioperative nursing interventions (Aljaaly, 2021; Zhang et al., 2020). Aljaaly (2021) described the perioperative nutrition care and dietetic practices for bariatric surgery patients in a Saudi hospital and highlighted the importance of patient education, goal-setting, and self-management support in promoting adherence to nutrition protocols and improving outcomes. Zhang et al. (2020) found that psychological care and patient education as part of ERAS management for urological surgery patients significantly reduced anxiety and depression, improved recovery, and increased satisfaction.

However, the studies also identified several barriers to implementing effective perioperative nursing interventions in the Saudi healthcare context. Resource constraints, such as staffing shortages, high workload, and limited access to equipment and supplies, were reported as challenges by several studies (Alenezi et al., 2022; Aldhahir, 2022). Cultural and linguistic barriers between nurses and patients, such as language differences, health literacy gaps, and social norms, were also identified as obstacles to effective communication and patient engagement (Albaqawi et al., 2023; Aldhahir, 2022).

Resistance to change and lack of buy-in from healthcare professionals and patients were another barrier to implementing new perioperative nursing interventions (Liu et al., 2017; Walters et al., 2016). Liu et al. (2017) reported that some physicians and nurses were initially skeptical about the ERAS program and required education and persuasion to adopt the new protocols. Walters et al. (2016) described the challenges of aligning the perioperative surgical home model with the existing culture and practices of the hospital and the need for continuous quality improvement and feedback to sustain the change.

These findings highlight the complex interplay of factors that influence the successful implementation of perioperative nursing interventions in Saudi hospitals. The enablers and barriers operate at multiple levels, including the individual (e.g., nurses' knowledge and skills), interpersonal (e.g., multidisciplinary collaboration), organizational (e.g., leadership support and resources), and sociocultural (e.g., patient engagement and cultural competence) domains. Understanding and addressing these factors is essential for optimizing the impact of perioperative nursing interventions on surgical outcomes and patient experiences in the Saudi healthcare context.

## **5. Discussion**

This systematic review synthesized the evidence on the effectiveness of perioperative nursing interventions in enhancing surgical outcomes in Saudi Arabian hospitals. The findings suggest that a wide range of interventions, from preoperative assessment and education to postoperative pain management and recovery support, can contribute to improved patient outcomes and experiences. The most promising

interventions appear to be those that are evidence-based, patient-centered, and involve multidisciplinary collaboration and coordination.

The review highlighted the positive impact of ERAS protocols, which involve a bundle of nurse-led interventions across the perioperative continuum, on reducing length of stay, complications, and costs, while improving patient satisfaction and quality of life (Aleid et al., 2023; Riad et al., 2023). These findings are consistent with the global evidence on the effectiveness of ERAS in various surgical specialties (Ljungqvist et al., 2017; Visioni et al., 2018). However, the successful implementation of ERAS in Saudi hospitals may require additional support and resources, given the cultural and organizational challenges identified in some studies (Aljaaly, 2021; Aldhahir, 2022).

Other effective perioperative nursing interventions identified in the review include patient education and counseling (Zhang et al., 2020; Fernández et al., 2022), pain management (Alnashri et al., 2023; Tang et al., 2024), infection prevention (Yao et al., 2024; Tolba et al., 2018), and comfort care (Dong et al., 2024; Tang et al., 2024). These interventions are aligned with the core competencies and responsibilities of perioperative nurses, as outlined in international standards and guidelines (AORN, 2019; ICN, 2021). However, their implementation in Saudi hospitals may be influenced by various factors, such as nurses' knowledge and skills, organizational support, and patient engagement, as highlighted in some studies (Alenezi et al., 2022; Albaqawi et al., 2023).

The barriers, such as resource constraints, cultural and linguistic challenges, and resistance to change, are also similar to the obstacles reported in other healthcare systems (Colquhoun et al., 2017; Safaeinili et al., 2020). Addressing these barriers may require a multi-faceted approach, involving policy changes, infrastructure investments, workforce development, and cultural competence training (Alkorashy & Al-Hothaly, 2022; Aldhahir, 2022).

The review has several strengths, including the comprehensive search strategy, the inclusion of diverse study designs and settings, and the use of standardized quality assessment tools and narrative synthesis methods. However, the review also has some limitations, such as the potential for publication and language bias, the heterogeneity of the included studies, and the lack of meta-analysis due to the variation in interventions and outcomes. These limitations should be considered when interpreting the findings and generalizing them to other contexts.

Despite these limitations, the review provides valuable insights and recommendations for policy, practice, and research to optimize perioperative nursing care and enhance surgical outcomes in Saudi Arabia. At the policy level, there is a need for national guidelines and standards that promote evidence-based and patient-centered perioperative nursing practices, as well as regulatory and accreditation mechanisms that ensure the quality and safety of surgical care (Alkorashy & Al-Hothaly, 2022; Kłęk et al., 2023). At the practice level, there is a need for ongoing training and education of nurses and other healthcare professionals, as well as the implementation of standardized protocols and pathways that facilitate multidisciplinary collaboration and coordination (Alenezi et al., 2022; Stucky et al., 2023). At the research level, there is a need for more robust and rigorous studies that evaluate the effectiveness and cost-effectiveness of perioperative nursing interventions, as well as the strategies for scaling up and sustaining their implementation in the Saudi healthcare system (Riad et al., 2023; Sorensen et al., 2024).

## **6. Conclusion**

In conclusion, this systematic review provides evidence on the effectiveness of perioperative nursing interventions in enhancing surgical outcomes and patient experiences in Saudi Arabian hospitals. The findings suggest that a range of interventions, from ERAS protocols to patient education and comfort care, can contribute to reduced complications, shorter length of stay, lower costs, and improved satisfaction and quality of life. However, the successful implementation of these interventions depends on various enablers and barriers, such as organizational support, training and education, multidisciplinary collaboration, patient engagement, resource constraints, and cultural challenges.

The review highlights the crucial role of nurses in optimizing perioperative care and driving the ongoing healthcare transformation in Saudi Arabia. By empowering nurses with the knowledge, skills, and resources to implement evidence-based and patient-centered interventions, fostering a culture of continuous quality improvement and multidisciplinary teamwork, and aligning nursing practices with the national healthcare goals, Saudi hospitals can achieve better surgical outcomes, enhance patient safety and satisfaction, and contribute to the realization of Vision 2030.

The review also identifies several recommendations for policy, practice, and research to strengthen perioperative nursing care in Saudi Arabia. These include the development of national guidelines and standards, the provision of ongoing training and education for nurses, the implementation of standardized protocols and pathways, the promotion of multidisciplinary collaboration and coordination, and the investment in robust and rigorous research to evaluate and scale up effective interventions. By addressing these recommendations, Saudi Arabia can build a sustainable and high-performing perioperative nursing workforce that delivers safe, efficient, and patient-centered surgical care.

As the country continues to transform its healthcare system and strive for excellence in patient outcomes, it is essential to recognize and leverage the vital contributions of perioperative nurses in driving quality improvement and patient safety. By empowering nurses as leaders and innovators, fostering evidence-based practices and interprofessional collaboration, and aligning nursing interventions with the national healthcare priorities, Saudi Arabia can achieve its vision of a world-class healthcare system that provides accessible, affordable, and high-quality care to all its citizens.

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