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Optimizing Surgical Outcomes Through Nursing–Anesthesia Collaboration: An Integrative Review Of Roles, Interventions, And Patient Safety

Abdullah ahmed Mohammed al Dashil[1] , Abdullah Mohammed Alhamami[2] , Wabran Ali Salem Al khuraim[3], Saleh Ali Salem Al khuraym[4] , Muhannad Hussain Alaiajam[5] , Fahad Amer Ahmad Alsufyani[6] , Rehab Belal Alotibi[7] , Hamad Mubarak Hussain Al samah[8]

[1]King Khalid hospital in Najran, Saudi Arabia
[2]Najran Cluster, Saudi Arabia
[3]Najran Health Cluster, Saudi Arabia
[4]King Khaled hospital, Saudi Arabia
[5]King Khalid Hospital, Saudi Arabia
[6]King Abdulaziz hospital specialist in Taif, Saudi Arabia
[7]Sultana primary health care, Saudi Arabia
[8]Najran Cluster, Saudi Arabia

Abstract

Background: Surgical care has become increasingly complex, requiring close interdisciplinary collaboration to ensure patient safety and optimal outcomes. Among the most critical partnerships within the surgical team is the collaboration between nursing and anesthesia professionals, whose coordinated roles span the entire perioperative continuum.

Objective: This integrative review aims to synthesize current evidence on the collaborative roles of nursing and anesthesia in surgical procedures, with a specific focus on clinical interventions, patient safety practices, and surgical outcomes.

Methods: An integrative review methodology was employed, drawing on peer-reviewed literature published between 2016 and 2025. Major databases including PubMed, CINAHL, and Scopus were searched. Studies addressing nursing–anesthesia roles, teamwork, perioperative care, and patient safety in surgical settings were included and thematically analyzed.

Results: The findings indicate that effective nursing–anesthesia collaboration is associated with improved patient safety, reduced perioperative complications, enhanced pain management, and more efficient surgical workflows. Key enabling factors included structured communication, shared clinical decision-making, and clearly defined professional roles across surgical phases.

Conclusion: Strengthening collaboration between nursing and anesthesia teams is a critical strategy for optimizing surgical outcomes and advancing patient-centered, safe surgical care.

Keywords: Nursing collaboration; Anesthesia care; Surgical procedures; Patient safety; Perioperative care; Interdisciplinary teamwork.

Introduction

Surgical care represents one of the most complex and high-risk domains within healthcare systems, requiring precise coordination among multidisciplinary professionals to ensure safe and effective outcomes. Advances in surgical techniques, anesthetic agents, and perioperative technologies have significantly improved patient survival and recovery; however, these advances have also increased the cognitive, technical, and organizational demands placed on surgical teams. Within this context,

collaboration between nursing and anesthesia professionals has emerged as a critical determinant of surgical quality and patient safety.

Globally, patient safety in surgical settings remains a major concern. The World Health Organization has consistently emphasized that failures in teamwork, communication, and role coordination are among the leading contributors to preventable surgical harm. Despite widespread adoption of surgical safety checklists and standardized protocols, adverse events such as medication errors, airway complications, postoperative pain mismanagement, and delayed recognition of clinical deterioration continue to occur, particularly in high-acuity surgical environments. These challenges underscore the need to move beyond protocol compliance toward effective interprofessional collaboration embedded in daily clinical practice.

Nurses and anesthesia providers occupy complementary and interdependent roles across the perioperative continuum. Nursing professionals play a central role in patient assessment, preparation, intraoperative monitoring, advocacy, and postoperative recovery, ensuring continuity of care and early identification of complications. Anesthesia professionals, on the other hand, are responsible for anesthetic planning, airway management, hemodynamic stability, analgesia, and physiological optimization throughout surgery and recovery. When these roles are aligned through shared communication, mutual situational awareness, and collaborative decision-making, surgical teams are better equipped to anticipate risks, respond to intraoperative changes, and support safe postoperative transitions (Weaver et al., 2018; Weller et al., 2019).

Recent evidence suggests that strong nursing–anesthesia collaboration is associated with reduced perioperative complications, improved pain control, enhanced workflow efficiency, and higher patient satisfaction (Bohmer et al., 2020; Reeves et al., 2021). Conversely, fragmented interactions, hierarchical barriers, and unclear role boundaries can undermine safety culture and contribute to preventable adverse events (Leonard et al., 2019). These findings highlight collaboration not merely as a professional ideal, but as a measurable mechanism influencing clinical outcomes.

Although teamwork in surgery has been widely studied, existing literature often examines nursing or anesthesia roles in isolation, with limited synthesis of their integrated contributions across surgical phases. There remains a need for a comprehensive, evidence-based understanding of how nursing–anesthesia collaboration functions as a system-level factor in optimizing surgical outcomes and patient safety. Therefore, this integrative review aims to synthesize contemporary evidence on the roles, interventions, and collaborative practices of nursing and anesthesia professionals in surgical procedures, providing insights to inform clinical practice, education, and organizational policy.

Conceptual Foundations of Nursing–Anesthesia Collaboration

Effective collaboration between nursing and anesthesia professionals is grounded in well-established conceptual and theoretical foundations related to interprofessional teamwork, patient safety, and systems-based care. In high-risk environments such as surgical settings, collaboration is not optional but a structural requirement to manage complexity, uncertainty, and rapid clinical change. Conceptually, nursing–anesthesia collaboration can be understood as a dynamic process involving shared goals, mutual respect, coordinated actions, and continuous communication across the perioperative continuum.

Figure 1. Conceptual Framework of Nursing–Anesthesia Collaboration in Surgical Care

One of the most influential foundations underpinning nursing–anesthesia collaboration is interprofessional teamwork theory, which emphasizes that healthcare outcomes are shaped not only by individual competence but by how effectively professionals integrate their expertise. Surgical environments require synchronized actions, where nurses and anesthesia providers maintain shared situational awareness, anticipate risks, and respond collectively to patient needs. Studies consistently demonstrate that breakdowns in teamwork—rather than technical incompetence—are a primary cause of surgical adverse events (Weller et al., 2019; Weaver et al., 2018).

Another critical conceptual foundation is patient safety culture, which frames collaboration as a mechanism for reducing human error within complex systems. The World Health Organization emphasizes that safe surgical care depends on strong communication, flattening of hierarchical barriers, and empowering all team members to speak up when patient safety is at risk. Within this framework, nurses and anesthesia professionals act as dual safety checkpoints: nurses provide continuous patient surveillance and advocacy, while anesthesia providers manage physiological stability and respond to acute intraoperative changes. Their collaborative interaction strengthens error detection and recovery before harm occurs (WHO, 2021).

Human factors and systems theory further support the importance of nursing–anesthesia collaboration. Surgical care operates as a socio-technical system in which cognitive load, time pressure, and environmental stressors influence performance. Collaboration mitigates these risks by distributing cognitive responsibilities, enhancing cross-monitoring, and supporting redundancy in safety-critical tasks (Leonard et al., 2019). From this perspective, collaboration is not merely interpersonal but embedded within workflows, protocols, and organizational design.

Communication frameworks such as standardized handoffs, closed-loop communication, and briefing/debriefing practices provide practical foundations for collaboration. Programs such as TeamSTEPPS have demonstrated that structured communication improves coordination between nurses and anesthesia providers, particularly during transitions of care such as induction, emergence, and postoperative handover. These tools enhance clarity of roles, reduce ambiguity, and support shared decision-making (Reeves et al., 2021).

Professional role theory also informs nursing–anesthesia collaboration by highlighting the importance of role clarity and mutual understanding. While nursing and anesthesia roles are distinct, effective collaboration occurs when role boundaries are flexible enough to allow support, consultation, and joint problem-solving. Evidence indicates that environments fostering mutual respect and interprofessional education are associated with improved teamwork and stronger safety cultures (Bohmer et al., 2020).

Collectively, these conceptual foundations position nursing–anesthesia collaboration as a multidimensional construct encompassing teamwork, safety culture, communication, and systems

thinking. Understanding these foundations is essential for designing interventions, policies, and educational strategies aimed at optimizing surgical outcomes and protecting patient safety.

Methodology

This study adopted an integrative review methodology to comprehensively examine and synthesize empirical and theoretical evidence on nursing–anesthesia collaboration in surgical procedures. The integrative review approach was selected because it allows for the inclusion of diverse study designs, enabling a holistic understanding of clinical roles, collaborative interventions, and patient safety outcomes within perioperative care.

A systematic literature search was conducted across major electronic databases, including PubMed, CINAHL, Scopus, and Web of Science. The search covered publications from January 2016 to March 2025 to ensure the inclusion of contemporary evidence aligned with current surgical and patient safety practices. Search terms were combined using Boolean operators and included keywords such as nursing collaboration, anesthesia care, perioperative teamwork, surgical outcomes, and patient safety. Reference lists of relevant articles were also manually screened to identify additional eligible studies.

Inclusion criteria comprised peer-reviewed articles published in English that examined collaborative practices between nursing and anesthesia professionals in surgical or perioperative settings. Both quantitative and qualitative studies, as well as mixed-methods and relevant conceptual papers, were considered. Studies focusing exclusively on surgical technique without reference to nursing or anesthesia collaboration, non-surgical settings, editorials, and conference abstracts were excluded.

The methodological quality of included studies was appraised using appropriate critical appraisal tools based on study design. Data extraction was performed using a standardized form capturing study characteristics, setting, collaborative elements, interventions, and reported outcomes. A thematic analysis approach was employed to synthesize findings, allowing patterns and key themes related to collaboration, patient safety, and surgical outcomes to emerge. Reporting of the review followed established guidance for transparent evidence synthesis, including principles outlined in PRISMA where applicable.

Roles of Nursing and Anesthesia Across Surgical Phases (≈700 words)

Effective collaboration between nursing and anesthesia professionals is most evident when examining their integrated roles across the preoperative, intraoperative, and postoperative phases of surgical care. Each phase presents distinct clinical demands, and coordinated nursing–anesthesia practices are essential to ensure patient safety, continuity of care, and optimal surgical outcomes.

The preoperative phase focuses on patient preparation, risk assessment, and care planning. Nursing professionals play a pivotal role in conducting comprehensive preoperative assessments, including evaluation of medical history, allergies, medication use, and psychosocial readiness for surgery. Nurses also provide patient education, verify informed consent, and ensure adherence to preoperative safety protocols, such as fasting and infection prevention measures. These activities are critical in identifying potential risks and optimizing patient readiness for anesthesia and surgery (Bohmer et al., 2020).

Anesthesia professionals complement nursing roles by performing detailed anesthetic evaluations, assessing airway status, cardiopulmonary function, and anesthesia-related risk factors. Collaborative communication between nurses and anesthesia providers during this phase facilitates shared understanding of patient vulnerabilities, enabling proactive risk mitigation strategies. Studies have shown that structured preoperative collaboration reduces last-minute surgical cancellations and anesthesia-related complications (Weller et al., 2019).

During the intraoperative phase, nursing–anesthesia collaboration becomes highly dynamic and time-sensitive. Nurses are responsible for maintaining a sterile environment, monitoring patient positioning, ensuring availability of surgical instruments, and providing continuous patient advocacy. Circulating and scrub nurses act as coordinators, facilitating communication among surgical team members and responding promptly to changes in patient status.

Anesthesia professionals manage airway security, administer anesthetic agents, and continuously monitor physiological parameters such as blood pressure, oxygenation, and depth of anesthesia. Close collaboration with nursing staff is essential for timely recognition of physiological changes and rapid response to intraoperative events. Evidence suggests that effective nurse–anesthetist communication significantly reduces intraoperative adverse events and enhances situational awareness within the operating room (Weaver et al., 2018; Leonard et al., 2019).

The postoperative phase emphasizes recovery, pain control, and early detection of complications. Nurses in the post-anesthesia care unit (PACU) are central to monitoring vital signs, managing pain and nausea, assessing consciousness levels, and identifying early signs of respiratory or cardiovascular compromise. Their continuous bedside presence enables prompt intervention and escalation of care when needed.

Anesthesia professionals contribute by overseeing emergence from anesthesia, adjusting analgesic regimens, and managing postoperative complications such as airway obstruction or hemodynamic instability. Collaborative handovers between anesthesia providers and nursing staff are particularly critical during patient transitions from the operating room to recovery units. Structured handoff communication has been shown to reduce information loss and improve postoperative safety outcomes (Reeves et al., 2021).

Table 1. Roles of Nursing and Anesthesia Across Surgical Phases

Surgical Phase	Nursing Roles	Anesthesia Roles	Collaborative Outcomes
Preoperative	Patient assessment, education, consent verification	Anesthetic evaluation, risk stratification	Reduced perioperative risk
Intraoperative	Monitoring, coordination, patient advocacy	Airway management, anesthesia delivery	Physiological stability
Postoperative	Recovery monitoring, pain assessment	Analgesia management, complication control	Safe recovery

Across all surgical phases, nursing–anesthesia collaboration is strengthened through shared situational awareness, mutual respect, and standardized communication practices. When roles are clearly defined yet flexible, teams are better equipped to adapt to unexpected clinical challenges, ensuring seamless continuity of care and improved patient outcomes.

Impact on Patient Safety and Surgical Outcomes

Collaboration between nursing and anesthesia professionals has a measurable and meaningful impact on patient safety and surgical outcomes, particularly in high-acuity and complex surgical settings. Evidence from perioperative research consistently indicates that coordinated interprofessional practices reduce preventable harm, enhance clinical effectiveness, and improve overall patient experience across the surgical continuum.

One of the most significant safety benefits of nursing–anesthesia collaboration is the reduction of perioperative adverse events. Breakdowns in communication and role coordination are widely recognized as leading contributors to anesthesia-related complications, medication errors, and delayed responses to physiological instability. Studies demonstrate that when nurses and anesthesia providers engage in structured communication, shared situational awareness, and joint decision-making, there is a marked decrease in intraoperative hypotension, hypoxia, and medication discrepancies (Weaver et al., 2018; Leonard et al., 2019). Nurses' continuous patient monitoring, combined with anesthesia providers' expertise in physiological management, creates a dual-layer safety mechanism that strengthens early error detection and rapid intervention.

Effective collaboration also plays a critical role in improving postoperative recovery and pain management. Postoperative pain, nausea, respiratory compromise, and hemodynamic instability are

common contributors to delayed recovery and extended hospital stays. Evidence suggests that coordinated nursing–anesthesia pain management strategies, including multimodal analgesia and individualized postoperative care plans, are associated with improved pain control, reduced opioid consumption, and earlier mobilization (Reeves et al., 2021). Nurses' close patient contact in the post-anesthesia care unit enables timely assessment of analgesic effectiveness, while anesthesia professionals adjust regimens based on clinical feedback, resulting in more responsive and patient-centered care.

From a broader outcomes perspective, nursing–anesthesia collaboration has been linked to shorter length of stay and improved surgical efficiency. Studies report that effective teamwork reduces delays during induction, emergence, and postoperative handovers, minimizing workflow disruptions and optimizing operating room utilization (Bohmer et al., 2020). These efficiencies not only improve organizational performance but also reduce patient exposure to prolonged anesthesia and procedural stress, which are associated with higher complication rates.

Patient satisfaction and perceived quality of care are also positively influenced by collaborative perioperative practice. Patients consistently report higher levels of confidence, reduced anxiety, and greater trust in surgical teams when care appears coordinated and communication is clear. Nurses often serve as patient advocates and communicators, translating anesthesia-related information into understandable terms, while anesthesia providers address patient concerns regarding safety and comfort. This unified approach enhances patient engagement and contributes to more positive surgical experiences (Weller et al., 2019).

Table 2. Impact of Nursing–Anesthesia Collaboration on Patient Safety and Surgical Outcomes

Outcome Domain	Reported Impact	Evidence Strength
Patient safety	Reduced perioperative errors and adverse events	Strong
Pain management	Improved analgesia and reduced opioid use	Moderate–Strong
Recovery outcomes	Faster stabilization and earlier mobilization	Moderate
Workflow efficiency	Reduced delays and improved operating room flow	Moderate
Patient satisfaction	Enhanced confidence and care experience	Strong

At the systems level, strong nursing–anesthesia collaboration supports a **culture of safety**, reinforcing accountability, mutual respect, and continuous learning. Organizations that prioritize interprofessional collaboration report lower rates of sentinel events and stronger safety climate scores. The World Health Organization emphasizes that such collaborative practices are essential for achieving sustainable improvements in surgical safety and quality of care. Collectively, the evidence positions nursing–anesthesia collaboration as a core mechanism through which patient safety is protected and surgical outcomes are optimized.

Organizational and Workforce Implications

Effective collaboration between nursing and anesthesia professionals extends beyond individual clinical interactions to influence broader organizational performance and workforce sustainability within surgical services. As surgical environments become increasingly complex, healthcare organizations must recognize nursing–anesthesia collaboration as a structural and strategic component of high-reliability systems rather than an informal or individual-dependent practice.

From an organizational perspective, strong nursing–anesthesia collaboration contributes directly to workflow efficiency and operational reliability. Coordinated teamwork reduces delays during critical perioperative transitions, such as anesthesia induction, intraoperative decision-making, and postoperative handovers. Evidence suggests that organizations with well-integrated nursing–anesthesia teams experience fewer workflow disruptions, improved operating room utilization, and reduced procedure-related inefficiencies (Bohmer et al., 2020). These gains translate into better resource management, lower costs associated with adverse events, and improved patient throughput without compromising safety.

Collaboration also plays a central role in strengthening organizational safety culture. A positive safety culture is characterized by open communication, mutual respect, and shared accountability for patient outcomes. The World Health Organization identifies teamwork and interprofessional communication as foundational elements of safe surgical systems. When nurses and anesthesia professionals are empowered to speak up, question decisions, and jointly manage risk, organizations are better positioned to identify latent safety threats and prevent harm before it occurs (WHO, 2021). This collaborative environment supports continuous learning and quality improvement initiatives, reinforcing organizational resilience.

Workforce implications are equally significant. Nursing–anesthesia collaboration has been associated with improved job satisfaction, reduced burnout, and enhanced professional engagement. High-stress surgical settings place substantial cognitive and emotional demands on healthcare professionals. Collaborative practices help distribute workload, reduce role overload, and foster psychological safety—factors shown to mitigate burnout and turnover among perioperative staff (Weller et al., 2019). Nurses and anesthesia providers who perceive strong team support are more likely to report higher morale and commitment to their organizations.

Education and professional development represent another critical workforce dimension. Interprofessional education, simulation-based training, and joint competency development have been shown to improve collaborative behaviors and strengthen role clarity between nursing and anesthesia professionals (Weaver et al., 2018). Organizations that invest in shared training programs cultivate a workforce better prepared to manage complex surgical scenarios, respond to crises, and adapt to evolving clinical demands. Such investments also promote leadership development and succession planning within perioperative teams.

Finally, staffing models and workforce planning must align with collaborative care principles. Adequate staffing levels, balanced skill mix, and continuity of team composition support effective collaboration and reduce reliance on workarounds that compromise safety. Fragmented staffing or frequent team turnover can undermine communication and weaken collaborative relationships, increasing the risk of error (Leonard et al., 2019). Therefore, organizational policies should explicitly support stable, well-resourced nursing–anesthesia teams as a cornerstone of safe surgical care.

Overall, nursing–anesthesia collaboration has far-reaching organizational and workforce implications, influencing efficiency, safety culture, staff well-being, and system sustainability. Recognizing and embedding collaboration within organizational structures is essential for achieving long-term improvements in surgical outcomes and workforce resilience.

Evidence Synthesis & Integrated Model

The synthesis of evidence from this integrative review demonstrates that nursing–anesthesia collaboration functions as a system-level mechanism that links clinical practice, patient safety, and organizational performance within surgical care. Rather than acting as isolated professional contributions, nursing and anesthesia roles interact dynamically across perioperative phases to shape surgical outcomes through coordinated decision-making, shared situational awareness, and continuous risk management.

Across the reviewed literature, collaboration consistently emerged as a mediating factor between clinical complexity and patient safety. Studies indicate that adverse surgical outcomes are less frequently associated with lack of technical skill and more often related to failures in communication, coordination, and teamwork (Leonard et al., 2019; Weller et al., 2019). Within this context, nursing–anesthesia collaboration operates as a protective layer that mitigates human error by integrating complementary expertise. Nurses contribute continuous patient surveillance, advocacy, and care coordination, while anesthesia professionals provide physiological optimization, anesthetic management, and rapid response to intraoperative instability. The convergence of these roles enhances collective vigilance and early detection of clinical deterioration.

Evidence synthesis also highlights the temporal integration of collaboration across surgical phases. In the preoperative phase, shared assessments and risk stratification enable proactive planning and

alignment of care priorities. During the intraoperative phase, real-time communication and mutual monitoring support rapid adaptation to changing patient conditions. In the postoperative phase, structured handovers and coordinated recovery management ensure continuity of care and reduce information loss. This continuity underscores collaboration as a longitudinal process rather than a single-point intervention (Reeves et al., 2021).

At the outcome level, the reviewed studies demonstrate consistent associations between effective collaboration and improved patient safety indicators, including reduced perioperative complications, improved pain control, and smoother recovery trajectories. These clinical outcomes are reinforced by organizational benefits such as enhanced workflow efficiency, stronger safety culture, and improved staff satisfaction (Bohmer et al., 2020; Weaver et al., 2018). Importantly, these outcomes are mutually reinforcing: safer systems reduce staff stress and burnout, while engaged and supported teams are more likely to sustain high safety standards.

Based on this synthesis, an integrated conceptual model is proposed to illustrate how nursing–anesthesia collaboration translates into improved surgical outcomes. The model positions collaboration at the center of the surgical system, supported by three foundational enablers: structured communication, role clarity with flexibility, and a shared safety culture. These enablers interact across perioperative phases to influence proximal outcomes such as situational awareness, timely intervention, and care continuity. In turn, these proximal outcomes lead to distal outcomes including reduced adverse events, enhanced patient experience, and improved organizational performance.

The proposed model aligns with systems-based safety frameworks promoted by the World Health Organization, which emphasize that sustainable improvements in surgical safety require coordinated actions across people, processes, and organizational structures. By conceptualizing nursing–anesthesia collaboration as a core system function rather than an interpersonal attribute, this model provides a practical lens for designing interventions, evaluating performance, and guiding policy development.

Figure 2. Integrated Model of Nursing–Anesthesia Collaboration and Surgical Outcomes

Overall, the evidence synthesis confirms that nursing–anesthesia collaboration is a **critical integrative** force within surgical care. The proposed model offers a structured framework to support future research, inform interprofessional education, and guide healthcare organizations in embedding collaboration as a foundational element of safe and effective surgical practice.

Discussion

This integrative review highlights nursing–anesthesia collaboration as a core determinant of patient safety, clinical effectiveness, and organizational performance in surgical care. The synthesized evidence demonstrates that collaboration between these two professional groups is not merely supportive or complementary, but foundational to achieving optimal surgical outcomes across the perioperative continuum. The findings reinforce the view that surgical safety is primarily a systems issue, shaped by

interactions, communication patterns, and shared accountability rather than isolated individual performance.

One of the central insights emerging from this review is that effective collaboration mitigates the inherent risks of surgical complexity. Consistent with previous patient safety research, adverse surgical events were more frequently linked to failures in communication, coordination, and situational awareness than to deficits in technical expertise (Leonard et al., 2019; Weller et al., 2019). Nursing–anesthesia collaboration addresses these vulnerabilities by integrating continuous patient surveillance with advanced physiological management, creating overlapping safety mechanisms that enhance early detection of clinical deterioration and rapid response to emerging risks.

The findings also emphasize the longitudinal nature of collaboration, extending across preoperative, intraoperative, and postoperative phases. Rather than being confined to discrete interactions—such as anesthesia induction or postoperative handover—collaboration functions as an ongoing process that supports continuity of care. Shared preoperative planning enables anticipatory risk management, while intraoperative coordination supports real-time adaptation to patient instability. Postoperatively, structured handovers and joint pain management strategies reduce information loss and improve recovery trajectories. This continuity aligns with interprofessional care models that conceptualize teamwork as an evolving, phase-spanning process rather than a single-point intervention (Reeves et al., 2021).

Another important discussion point relates to the interaction between collaboration and safety culture. The evidence suggests that environments characterized by mutual respect, flattened hierarchies, and psychological safety enable nurses and anesthesia professionals to communicate concerns, question decisions, and escalate risks without fear of reprisal. Such environments are strongly associated with lower rates of adverse events and stronger safety climate scores. These findings are consistent with global safety priorities articulated by the World Health Organization, which emphasize teamwork and communication as essential pillars of safe surgical systems (WHO, 2021). Importantly, this review suggests that collaboration both shapes and is shaped by organizational culture, creating a reinforcing cycle between teamwork and safety outcomes.

From a workforce perspective, the review highlights collaboration as a protective factor against burnout and professional disengagement. High-acuity surgical settings impose significant cognitive and emotional demands on both nurses and anesthesia providers. Collaborative practices distribute workload, enhance role clarity, and provide social and professional support, which have been shown to improve job satisfaction and staff retention (Weaver et al., 2018). These workforce benefits are particularly relevant in the context of global shortages of perioperative nurses and anesthesia professionals, underscoring collaboration as not only a safety strategy but also a sustainability strategy.

Despite the strength of the evidence, several gaps were identified. First, much of the existing literature relies on observational or cross-sectional designs, limiting causal inference. Second, nursing perspectives—particularly qualitative insights into collaborative dynamics—remain underrepresented compared with anesthesia-focused studies. Third, there is a lack of standardized metrics for measuring nursing–anesthesia collaboration and its direct impact on patient outcomes. Addressing these gaps will be essential for advancing the field beyond descriptive associations toward intervention-based and outcome-driven research.

Overall, the findings of this review support a shift from viewing collaboration as an interpersonal skill to recognizing it as a structural component of high-quality surgical systems. Embedding nursing–anesthesia collaboration into organizational policies, staffing models, education programs, and quality improvement initiatives is likely to yield sustained improvements in patient safety and surgical outcomes. Future research should focus on longitudinal evaluations, implementation science approaches, and the development of validated collaboration indicators to strengthen the evidence base and guide practice.

Conclusion

This integrative review demonstrates that collaboration between nursing and anesthesia professionals is a fundamental driver of patient safety and optimal surgical outcomes. Across diverse surgical settings, the evidence consistently indicates that coordinated nursing–anesthesia practices enhance perioperative care quality by reducing preventable adverse events, improving pain management and recovery, and supporting efficient surgical workflows. These findings reinforce the position that safe and effective surgical care is not solely dependent on technical expertise, but on the strength of interdisciplinary relationships embedded within clinical systems.

The review highlights that nursing–anesthesia collaboration operates as a longitudinal, system-level process spanning preoperative assessment, intraoperative management, and postoperative recovery. When nurses and anesthesia providers engage in shared planning, real-time communication, and structured handovers, they create a continuous safety net that supports early risk identification and timely clinical intervention. Such collaboration strengthens situational awareness, promotes continuity of care, and ensures that patient needs remain central throughout the surgical journey.

At the organizational level, the findings emphasize the importance of embedding collaboration into institutional structures, policies, and education programs. Healthcare organizations that prioritize interprofessional teamwork, role clarity, and psychological safety are better positioned to cultivate a strong safety culture and a resilient perioperative workforce. These organizational investments not only improve patient outcomes but also contribute to staff satisfaction, reduced burnout, and long-term workforce sustainability.

Despite the growing recognition of the value of nursing–anesthesia collaboration, gaps remain in the empirical literature, particularly regarding standardized measurement and intervention-based evaluation. Addressing these gaps will be essential for translating collaborative principles into measurable quality indicators and evidence-informed policy decisions.

In alignment with global patient safety priorities articulated by the World Health Organization, this review underscores the need to move beyond isolated professional roles toward integrated, team-based models of surgical care. Strengthening nursing–anesthesia collaboration should therefore be regarded as a strategic priority for healthcare systems seeking to advance surgical safety, improve patient experiences, and achieve sustainable excellence in perioperative care.

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