Original article

Nursing in oral and maxillofacial surgery: A clinical pathway and nursing-sensitive outcomes approach - a narrative review

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Abstract

Background: Oral and maxillofacial surgery involves procedures in anatomically complex regions associated with respiration, swallowing, phonation, and facial appearance. Patients may experience perioperative complications, including airway obstruction, secondary hemorrhage, surgical site infection, malnutrition, microvascular flap complications and psychological distress. Nurses contribute to perioperative surveillance, recognition of clinical deterioration and continuity of care.

Objectives: To describe and synthesize literature on nursing roles across the perioperative continuum (preoperative, intraoperative, postoperative and rehabilitation phases) and to discuss reported clinical outcomes relevant to nursing care in oral and maxillofacial surgery.

Methods: This narrative review searched literature published between 2000 and 2026 in PubMed/MEDLINE, supplemented by relevant clinical practice guidelines and professional recommendations. Search terms covered oral and maxillofacial surgery, perioperative nursing, airway and tracheostomy care, free-flap monitoring, pain, nutrition, oral hygiene, patient safety, enhanced recovery and nursing-sensitive outcomes (NSOs). Relevant reviews and clinical studies were also considered. The review was guided by the SANRA criteria. Findings were narratively organized by clinical care domain; no quantitative meta-analysis was undertaken.

Results: The literature reviewed highlighted several recurring domains of perioperative nursing care: preoperative risk assessment and patient education, intraoperative asepsis, instrument management and use of the WHO Surgical Safety Checklist and postoperative monitoring of airway status, bleeding, wounds, tracheostomy, pain, nutrition and reconstructive flap perfusion. Guidelines and reviews also emphasized multidisciplinary care and components of Enhanced Recovery After Surgery (ERAS) pathways. Across these domains, early recognition of deterioration, standardized procedures and clear communication were commonly identified as important care processes; however, the strength of evidence linking individual nursing interventions to specific outcomes varied by domain.

Conclusions: The reviewed literature describes nursing as an important component of coordinated perioperative care and patient safety in oral and maxillofacial surgery. Clinical pathways, specialized training and evaluation using relevant NSO indicators may support more consistent care and future assessment of outcomes. Further well-designed studies are needed to clarify the association between specific nursing practices and clinical outcomes.

Keywords: *oral and maxillofacial surgery; perioperative nursing; patient safety; airway management; free reconstructive flap; nursing-sensitive outcomes (NSOs).*

1. INTRODUCTION

Oral and maxillofacial surgery is a specialized surgical discipline encompassing procedures ranging from minor oral surgery and orthognathic surgery to complex trauma management, head and neck tumor resection and microvascular flap reconstruction. The anatomical and functional complexity of the head and neck region, which encompasses respiration, swallowing, phonation and facial appearance, presents specific challenges for perioperative care. Depending on the type and extent of surgery, patients may be at risk of complications such as airway obstruction, postoperative hemorrhage, surgical site infection, nutritional impairment and compromised reconstructive flap perfusion.

Airway management is an important component of perioperative care in oral and maxillofacial surgery. Postoperative soft tissue edema, hematoma

and anatomical alterations may contribute to respiratory distress or airway obstruction. Clinical literature highlights the importance of appropriate airway assessment and postoperative monitoring in identifying potential complications [1]. Within this context, nurses contribute to ongoing observation and the recognition of clinical deterioration, in coordination with surgeons, anesthesiologists and other healthcare professionals.

Postoperative hemorrhage also warrants particular attention because blood mixed with saliva and oral secretions may complicate the assessment of blood loss, while blood accumulation in the oropharynx may compromise ventilation or increase aspiration risk. Timely recognition and communication of abnormal bleeding are therefore important components of postoperative surveillance [2, 3]. The identification and management of these complications, however, depend on coordinated multidisciplinary care, appropriate monitoring protocols and timely clinical decision-making rather than on nursing activities alone.

Patients undergoing extensive procedures, particularly head and neck cancer resections with free flap reconstruction may also experience malnutrition, dysphagia, communication difficulties, surgical site complications and impaired flap perfusion. Multidisciplinary perioperative care pathways, including Enhanced Recovery After Surgery (ERAS) approaches, have been recommended to coordinate preoperative optimization, postoperative monitoring, nutritional support, rehabilitation and discharge planning [2-4]. Nurses participate in implementing these care components and maintaining continuity of care, although the extent to which individual nursing interventions contribute independently to specific clinical outcomes requires careful evaluation of the available evidence [5, 6].

Despite the recognized importance of perioperative nursing in managing these clinical challenges, the evidence relevant to specialized nursing practice in oral and maxillofacial surgery is distributed across different clinical domains, including airway and tracheostomy care, hemorrhage surveillance, free-flap monitoring, pain management, nutrition, oral hygiene and functional rehabilitation. In addition, evidence supporting multidisciplinary care pathways does not necessarily establish the independent effect of individual nursing interventions. This creates a need to synthesize the available literature, clarify the scope of nursing responsibilities and identify relevant nursing-sensitive outcomes (NSOs), while distinguishing established clinical recommendations from areas where direct evidence remains limited.

Accordingly, this narrative review aims to synthesize and organize the literature on nursing care across the perioperative continuum in oral and maxillofacial surgery, with particular attention to specialized care domains, clinical pathways and relevant NSOs. It also discusses limitations in the current evidence and identifies priorities for future research to support the development and evaluation of specialized nursing practice.

2. MATERIALS AND METHODS

2.1. Study design

The study was designed as a narrative review, to synthesize and discuss literature relevant to specialized nursing care in oral and maxillofacial surgery. The review was informed by the SANRA (Scale for the Assessment of Narrative Review Articles) criteria to support the quality of reporting, including the justification of the review, description of the literature search, referencing, and presentation of relevant evidence [7]. The review was not designed as a systematic review or meta-analysis.

2.2. Literature Search Strategy

Literature published between 2000 and 2026 was searched in PubMed/MEDLINE, supplemented by relevant clinical practice guidelines and professional recommendations. The search strategy used combinations of terms related to “oral and maxillofacial surgery”, “maxillofacial surgery”, “head and neck surgery”, “nursing”, “perioperative nursing”, “postoperative care”, “airway management”, “tracheostomy”, “free flap monitoring”, “pain management”, “nutrition”, “oral hygiene”, “patient safety”, “enhanced recovery” and “nursing-sensitive outcomes”. Search terms were combined according to the relevance of each clinical domain. Reference lists of relevant reviews and guidelines were also considered to identify additional pertinent publications. The search was intended to identify literature relevant to the review objectives rather than to provide an exhaustive retrieval of all available studies.

2.3. Inclusion Criteria and Data Synthesis

Literature was considered for inclusion based on its relevance to perioperative nursing care in oral and maxillofacial surgery, with emphasis on clinical practice guidelines, professional consensus statements, systematic reviews, meta-analyses, clinical trials and relevant review articles. Foundational publications were also considered when they provided important background or clinical

guidance. Sources were appraised narratively with attention to their relevance to the review objectives, study design and the nature of the evidence presented. The findings were organized by major clinical domains, including airway and tracheostomy care, hemorrhage and wound surveillance, pain management, nutrition, free-flap monitoring, oral hygiene, rehabilitation, clinical pathways and nursing-sensitive outcomes (NSOs). The synthesis was descriptive and interpretive, with consideration of the applicability and limitations of the available evidence. No quantitative meta-analysis was performed.

3. REVIEW OF THE LITERATURE

3.1. Clinical characteristics in oral and maxillofacial surgical care

Nursing care for oral and maxillofacial surgical patients requires specialized expertise to address distinct clinical challenges, structured into four main operational domains:

Airway Compromise and Nursing Surveillance: Anatomical disruption, surgical swelling, bleeding, or excessive mucus production create severe airway compromise risks, especially following oncological resections, severe trauma, or tracheostomies. These risks require close respiratory monitoring, assessment of airway patency, maintenance of tracheostomy cannula patency, and suctioning when clinically indicated. Appropriate patient positioning and other aspiration-prevention measures should be implemented according to the patient's clinical condition and airway management needs [1, 8, 10]. For patients undergoing free-flap reconstruction, postoperative flap monitoring represents a distinct nursing responsibility and should be discussed separately, supported by literature specifically addressing flap surveillance [5, 6].

Hemorrhage, Surgical Wounds and Infection Control Nursing: Oral cavity incisions are constantly exposed to saliva and bacterial flora, alongside surgical drains and complex tissue defects. Nurses must maintain rigorous wound surveillance, quantify drain losses accurately, detect occult bleeding early and execute strict oral hygiene protocols to prevent surgical site infection [9-11].

Organ Dysfunction and Rehabilitative Nursing Interventions: Postoperative pain, edema, trismus, intermaxillary fixation, or structural resections hinder swallowing, nutrition and verbal communication. Nurses actively coordinate multidisciplinary care by administering tailored enteral nutrition, conducting specialized mouth care and implementing non-verbal communication tools to promote functional recovery [12-14].

Psychosocial Impact and Therapeutic Supportive Care: Facial trauma or ablative surgery may result in visible facial changes that affect body image, emotional well-being and social functioning. Patients may experience psychological distress, anxiety or difficulties with social reintegration, although the nature and severity of these responses vary among individuals. Nurses can contribute to psychosocial support through attentive assessment of emotional needs, therapeutic communication, clear patient education and appropriate referral to psychological or other support services. These interventions may help patients cope with changes in appearance and facilitate psychosocial readjustment during recovery [15].

3.2. Stage-specific roles of perioperative nursing

Specialized nursing care spans the full perioperative spectrum, applying evidence-informed practices designed to address specialty-specific hazards and support the achievement of nursing-sensitive outcomes (NSOs) (Table 1).

Table 1. Summary of nursing roles across the perioperative care continuum

Stage	Specialty-specific risk focus	Evidence-informed nursing interventions	Associated nursing-sensitive outcomes (NSOs)
Preoperative	Airway difficulty, malnutrition, psychological distress, systemic comorbidities [1, 2, 10, 12, 13, 15]	Airway risk screening, physiological optimization in collaboration with the multidisciplinary team and structured patient education [1, 2, 10]	Early identification of airway risks, improved patient preparedness and patient-reported anxiety or understanding of care [1, 2, 10]
Intraoperative	Infection, retained foreign objects, intraoperative aspiration [9, 10, 16]	Aseptic practice, instrument and material count protocols and use of a surgical safety checklist adapted to maxillofacial procedures [9, 10, 16]	Compliance with safety protocols, occurrence of preventable safety events and surgical site infection (SSI) rates [9, 16]

PACU and Early Post-op	Acute airway obstruction, active hemorrhage, severe pain and flap compromise [1, 3, 10, 14, 17]	Continuous assessment of airway, breathing and circulation (ABC); drain output monitoring; multimodal analgesia according to the prescribed plan and timely flap surveillance [1, 5, 6, 10, 14, 17]	Timely recognition and escalation of airway or bleeding complications, pain intensity and early detection of potential flap compromise [1, 5, 6, 10, 14, 17]
Subsequent Post-op	SSI, cannula occlusion, dysphagia, malnutrition, and body image distress [8-10, 12, 13, 15]	Airway and tracheostomy care, including maintenance of cannula patency, stoma care, secretion management and cuff-pressure monitoring when indicated, according to standardized protocols [9, 10].	SSI occurrence, tracheostomy-related complications, nutritional status, functional recovery and length of stay [2, 8-13, 17]
Discharge and Post-Discharge	Care non-adherence, unrecognized red-flag symptoms and hospital readmission [2, 10, 17]	Teach-back discharge education, recognition of warning signs and coordination of follow-up care [2, 10, 17]	Patient understanding of discharge instructions, adherence to follow-up, patient satisfaction and post-discharge readmission [2, 10, 17]

3.2.1. Preoperative assessment and preparation

Preoperative nursing focuses on proactive risk identification. Beyond taking routine vital signs, nurses perform specialized airway risk screening for patients with oral cavity tumors, severe infections, trismus, or facial fractures to facilitate timely interdisciplinary assessment and planning [1]. Furthermore, structured preoperative counseling may help address patient anxiety and support participation in postoperative rehabilitation [2, 18].

3.2.2. Intraoperative safety management

Operating room nurses ensure strict aseptic integrity and meticulous instrument reconciliation [10]. The WHO Surgical Safety Checklist provides a general framework for promoting surgical safety and team communication [16]. For maxillofacial procedures, the authors propose considering procedure-specific checklist items addressing airway security, hemorrhage risks and jaw fixation, where applicable. This proposed adaptation should be regarded as a context-specific recommendation rather than a validated maxillofacial checklist. Comprehensive nursing handovers to the post-anesthesia care unit (PACU) should communicate relevant respiratory support, intraoperative events and specific postoperative risks to promote continuity of care. The content of the handover should be tailored to the patient's clinical condition and the procedure performed [1, 2, 10].

3.2.3. PACU monitoring and early postoperative care

Acute airway obstruction, active hemorrhage, severe pain and flap compromise [1, 4, 10].

Continuous assessment of airway, breathing and circulation (ABC); monitoring of drain output; multimodal analgesia according to the prescribed plan and established postoperative pain management principles [1, 5, 6, 10, 14, 19] and timely flap surveillance [5, 6, 19].

Potential nursing-sensitive indicators include timely recognition and escalation of airway or bleeding complications, systematic pain assessment and appropriate reporting of inadequate pain control [10, 14] and early recognition of suspected flap compromise [5, 6, 19]. These indicators are proposed for further operational definition and validation in the maxillofacial surgery setting.

3.3. Core domains of specialized nursing care

3.3.1. Airway management and tracheostomy care

Given the high vulnerability to upper airway compromise from anatomical edema and bleeding, airway management is a foundational nursing domain [1]. Assessment of respiratory effort, oxygen saturation, secretion burden and airway patency can support the early recognition of respiratory deterioration and the timely escalation of care [1, 10]. For tracheostomy patients, nursing care should follow standardized, patient-specific protocols addressing inner cannula patency, stoma care and cuff-pressure monitoring, as appropriate [8, 10]. These measures are intended to maintain airway patency and support the early recognition of complications; however, their effects on accidental decannulation and tube-obstruction rates should not be stated as established unless directly supported by the cited evidence.

3.3.2. Monitoring hemorrhage, surgical wounds, and infection

Maxillofacial bleeding carries severe risks of airway occlusion and hemodynamic collapse [1, 11]. Meticulous monitoring of dressing saturation, drain output trends and systemic vitals enables early recognition of hidden hemorrhage before hypovolemic shock develops. Moreover, nurse-led oral decontamination and adherence to evidence-based surgical wound care recommendations, including WHO guidelines, are relevant components of postoperative infection prevention [9, 11]. However, the available references do not establish that combining these interventions significantly reduces surgical site infection (SSI) rates or post-surgical pain. Postoperative pain management should be addressed separately in accordance with relevant clinical practice recommendations [14].

3.3.3. Postoperative pain and symptom management

Regular pain assessment using validated tools (VAS/NRS) forms the cornerstone of effective symptom relief [14]. Current recommendations support multimodal analgesia combining pharmacological and non-pharmacological approaches, with nurses contributing to pain assessment, implementation of prescribed interventions and monitoring of treatment response [14, 18]. However, the cited references do not directly establish that nurse-managed multimodal analgesia reduces opioid consumption. Proactive nursing assessment and management of postoperative nausea and vomiting (PONV) may support the early identification of symptoms and timely intervention; however, the cited evidence does not establish that these measures prevent wound disruption and aspiration or accelerate recovery [2, 10].

3.3.4. Nutrition and functional rehabilitation

Adhering to ESPEN guidelines, minimizing fasting times and initiating prompt nutritional support are essential for wound healing [13]. Due to constraints imposed by intermaxillary fixation, pain and dysphagia, nurses need to collaborate within an interprofessional team (clinical nutritionists, speech therapists) to formulate individualized intervention plans-particularly for head and neck cancer patients at high risk of malnutrition-to support nutritional management and functional rehabilitation [12, 13]. Early nutritional screening by nurses and timely implementation of individualized nutritional care may help identify nutritional risk and facilitate appropriate nutritional support. However, the cited guidelines do not establish that nurse-led screening and feeding independently preserve lean body mass, reduce wound complications, or shorten hospital stay [12, 13].

3.3.5. Free reconstructive flap monitoring

Microvascular flap procedures demand strict, structured postoperative nursing surveillance [3, 5, 6]. The frequency of flap assessments should follow procedure-specific protocols and the surgical team's instructions, with particularly close surveillance during the early postoperative period [4, 5, 6]. Clinical assessment includes tissue color, temperature, capillary refill time (CRT) and other relevant findings. Venous congestion may present with bluish or dusky tissue and rapid capillary refill, whereas arterial insufficiency may present with pale tissue and delayed capillary refill [5, 6]. These clinical findings should be interpreted together rather than used as isolated diagnostic criteria. Structured nursing surveillance may facilitate early recognition of suspected vascular compromise and prompt escalation for surgical assessment and possible re-exploration, thereby supporting efforts to salvage the flap [3, 5, 6, 19].

3.3.6. Oral care, communication, and psychosocial support

Swelling, pain and intermaxillary fixation severely impede self-conducted oral hygiene and verbal speech [11, 14]. Professional nurse-administered oral care may support oral hygiene and patient comfort [11]. For patients whose speech is impaired following tracheostomy or head and neck surgery, alternative communication strategies may be considered to facilitate the expression of basic needs and discomfort. Tracheostomy-specific care recommendations should be consulted when selecting appropriate communication approaches [8]. The use of non-verbal communication tools should be regarded as a supportive care strategy; however, its effectiveness in patients undergoing maxillofacial surgery cannot be established from the currently cited references alone. Patients undergoing head and neck reconstruction may experience body image disturbance and psychosocial difficulties that affect their social adjustment [15]. Nurses can provide emotional support, assess psychosocial needs and facilitate access to psychological counseling and rehabilitation services as appropriate. However, the effectiveness of these nursing interventions in reducing body image distress and improving social adjustment requires further evaluation.

3.3.7. Multidisciplinary care and eras pathways

Enhanced Recovery After Surgery (ERAS) pathways combine preoperative preparation, multimodal analgesia, early enteral feeding and rapid

mobilization. Nurses contribute to the coordination of care and implementation of pathway components within multidisciplinary teams [2, 13, 20, 21-24]. Evidence synthesized in a systematic review and meta-analysis of ERAS pathways for head and neck free-flap reconstruction suggests that these programs may improve postoperative outcomes, including complication rates and length of stay [22]. Other publications on ERAS in head and neck surgery provide additional context regarding pathway implementation and perioperative care [23, 24]. However, the reported outcomes reflect the effects of multidisciplinary care pathways and cannot be attributed specifically to nurse-led implementation. The independent contribution of nursing leadership remains insufficiently established by the cited evidence [20, 21, 22].

3.3.8. Patient education and discharge planning

Structured, repetitive patient education using the teach-back technique may reinforce patients' understanding and support post-discharge self-management [25]. Discharge education should address wound care, medication safety and warning signs that require prompt medical assessment. For patients undergoing maxillofacial or head and neck surgery, these warning signs may include breathing difficulties, active bleeding, sudden swelling and changes in flap color, as clinically applicable. These recommendations should be guided by procedure-specific postoperative care protocols and should not be interpreted as evidence that a particular educational intervention has been proven to prevent complications in this patient population. Although systematic review evidence suggests that teach-back discharge education may be associated with lower 30-day readmission rates in some patient populations, the available evidence does not establish a similar effect specifically in patients undergoing maxillofacial or head and neck surgery [25].

3.4. Nursing care pathway model

The nursing care pathway model (Figure 1) provides a conceptual framework for integrating specialized nursing responsibilities into a continuous, coordinated care process throughout the perioperative journey in oral and maxillofacial surgery.

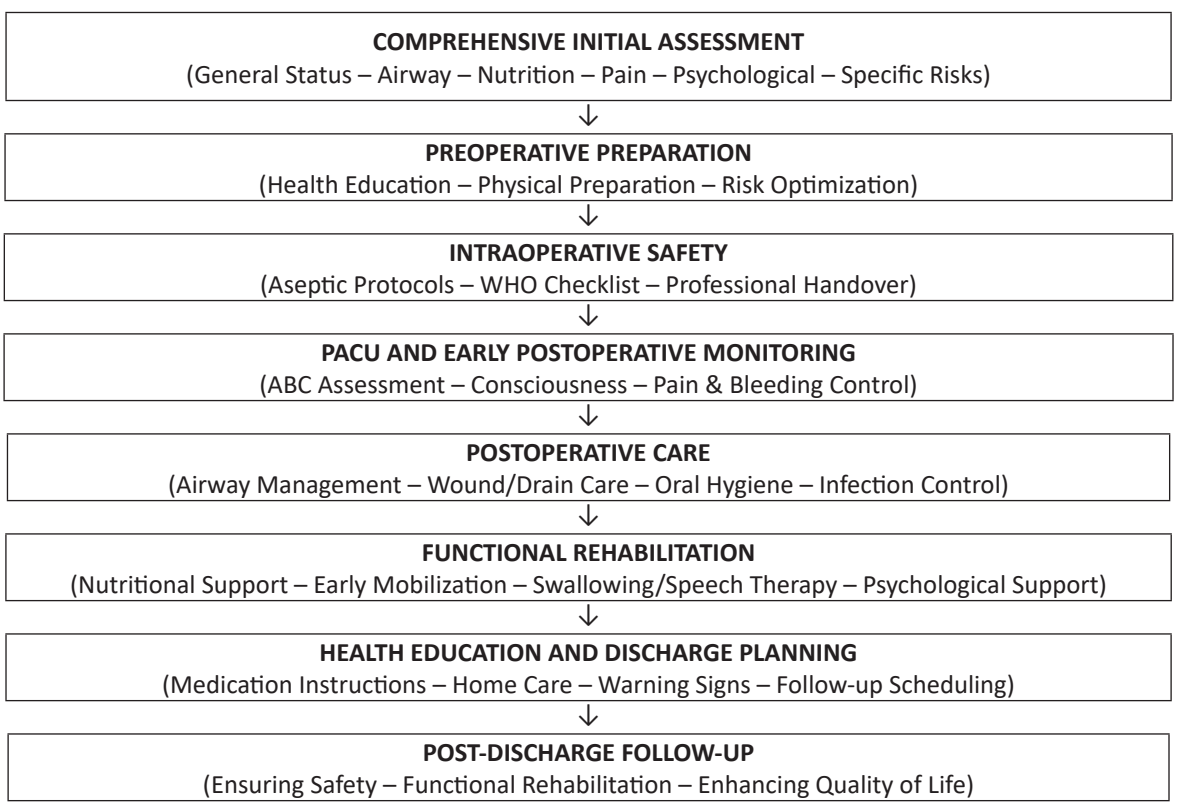


Figure 1. Perioperative nursing care pathway in oral and maxillofacial surgery

The care pathway model (Figure 1) targets three strategic priorities [1, 2, 13], to aim:

Standardize specialized nursing practices across preoperative, intraoperative and postoperative phases.

Facilitate early recognition of complications and timely nursing interventions through systematic surveillance and interdisciplinary coordination.

Promote patient safety, recovery and continuity of care through patient education, discharge planning and follow-up.

These objectives can be evaluated through measurable nursing-sensitive outcomes, including complication recognition time, postoperative recovery indicators, patient functional status and quality-of-care measures.

It should be noted that Figure 1 represents a conceptual model proposed to guide specialized perioperative nursing practice rather than a pathway whose effectiveness has been established through real-world implementation. Further prospective studies are needed to assess its feasibility, clinical applicability and potential impact on patient outcomes and quality of care [20].

3.5. Nursing-sensitive outcomes

The assessment of nursing care quality may incorporate nursing-sensitive indicators and outcomes, which are used to examine aspects of nursing practice and their relationships with patient outcomes [20, 26–28]. Within the Donabedian Structure–Process–Outcome framework, the present review proposes a conceptual approach to examining specialized nursing care in maxillofacial surgery. The proposed indicators are organized into three domains: direct nursing care indicators, multidisciplinary patient clinical outcomes and healthcare economic outcomes. This classification is intended to guide future research rather than to represent a validated set of specialty-specific NSOs:

Core Specialty-Specific NSOs (Direct Nursing Quality Indicators): These metrics reflect nursing vigilance and adherence to established protocols [12]. Potential indicators include: (1) Time to detect airway distress or tracheostomy obstruction [1, 6, 7]; (2) Time to identify suspected microvascular flap ischemia (venous or arterial) [8, 9]; (3) Time to recognize suspected surgical bleeding [10]; (4) Compliance with oral hygiene and tracheostomy care protocols [7, 11]; and (5) Completion of multimodal pain assessments and nutritional risk screening [17]. These indicators should be operationally defined and validated for the maxillofacial surgery setting before being adopted as a standardized NSOs set [20, 21].

Patient Clinical Outcomes (Multidisciplinary Health Outcomes): These outcomes may be influenced by nursing care, surgical technique, anesthesia, baseline patient characteristics and other aspects of multidisciplinary management [12, 13]. They include overall complication rates, surgical site infection (SSI) incidence, tracheostomy-related pulmonary complications, free flap salvage success, 30-day readmissions and functional recovery (swallowing, speech and body image adaptation) [2, 13-18]. They should therefore be interpreted as multidisciplinary patient outcomes rather than direct measures of nursing performance alone.

Healthcare Economic Outcomes (System Efficiency Indicators): Healthcare economic outcomes may include hospital length of stay (LOS), intensive care unit utilization, costs associated with secondary reconstructive procedures following flap failure and overall healthcare expenditure [2, 3, 11, 13]. These outcomes may be associated with timely recognition of complications and effective care coordination, but they are also influenced by disease severity, surgical complexity, institutional resources and other factors. Their attribution to nursing interventions requires appropriately designed empirical studies [17].

Distinguishing these outcome domains may help healthcare leaders and researchers assess the contribution of specialized nursing within multidisciplinary maxillofacial surgical teams [12]. The proposed framework is conceptual and requires further operational definition and empirical validation in this specialty.

4. DISCUSSION

The reviewed literature highlights specialized nursing in oral and maxillofacial surgery as a comprehensive care model characterized by four core strengths:

First, continuous surveillance and rapid event detection during critical windows: Although physicians conduct periodic clinical assessments, bedside nurses are well positioned to provide ongoing surveillance and identify changes in patients' clinical status [5, 10, 22]. This surveillance may facilitate the recognition of acute deterioration, including airway compromise and bleeding; assessment of airway-related risks should be guided by the patient's clinical condition and, where applicable, tracheostomy-specific care recommendations [1, 8, 10]. For patients undergoing free-flap reconstruction, regular assessment of flap color, capillary refill and Doppler signals may help identify signs of compromised flap perfusion and prompt timely clinical evaluation [5, 6, 19].

Second, specialty-specific clinical demands

requiring advanced competencies: The head and neck region is involved in vital physiological functions, including breathing, eating, speaking and facial expression [1]. Surgical procedures in this region may therefore involve complex risks affecting multiple functions [1, 2]. Specialized procedures, such as tracheostomy management, oral wound care, aspiration risk prevention and microvascular flap monitoring, require specific knowledge and skills [6 - 8, 15, ~~24~~, 23]. These requirements support the need for dedicated training pathways to strengthen clinical assessment, recognition of complications and appropriate escalation of care [12, 26].

Third, transition toward evaluation using Nursing-Sensitive Outcomes (NSOs): Healthcare systems increasingly emphasize objective quality indicators alongside descriptions of nursing roles and activities [12, 13, 27]. Available literature suggests that structured care pathways, including Enhanced Recovery After Surgery (ERAS) programs and flap monitoring protocols, may be associated with earlier complication recognition, lower surgical site infection (SSI) rates, earlier mobilization and shorter hospital stays [11, 13, 24, 28]. However, these outcomes may also be influenced by surgical practice, patient characteristics, multidisciplinary coordination and institutional resources. Further studies are needed to clarify the contribution of nursing interventions to these outcomes in oral and maxillofacial surgery.

Fourth, psychosocial advocacy and long-term reintegration: Facial disfigurement following trauma or oncological surgery may be associated with body image disturbance and psychosocial difficulties [15]. Nurses may contribute to psychosocial support by assessing emotional distress, providing education on self-care and adaptation and facilitating access to psychological counseling and rehabilitation services when needed. However, the extent to which these nursing activities improve psychosocial adjustment and social reintegration remains to be established through studies using appropriate patient-reported outcomes.

5. LIMITATIONS OF CURRENT EVIDENCE AND DIRECTIONS FOR FUTURE RESEARCH

While this review synthesizes key domains of maxillofacial nursing, several limitations regarding review methodology and available literature should be noted:

Limitations of this Review and Existing Evidence:

Methodological limitations: As a narrative review, systematic database searching across all indexes or quantitative meta-analyses were not performed, introducing potential selection bias. Language inclusion was limited to English and Vietnamese.

Literature gaps: Much of the current literature consists of single-center observational studies or consensus reports. Multi-center studies directly linking specific nursing practices to standardized NSOs remain scarce.

Directions for Future Research:

Clinical Pathway Standardization: Conducting prospective empirical studies to evaluate protocol compliance, safety and effectiveness of standardized nursing pathways.

Validation of Specialty NSOs Frameworks: Defining and validating a standardized set of maxillofacial NSOs across clinical settings.

Multi-Center Interventional Studies: Designing high-quality multi-center trials to evaluate the effects of nursing interventions on complication rates, readmissions and cost outcomes.

Patient-Reported Outcome Research: Investigating long-term quality of life, body image adaptation and functional outcomes following reconstructive surgery.

6. CONCLUSION

Nurses play an important and continuous role in the care continuum for oral and maxillofacial surgical patients. Given the anatomical and functional complexity of the head and neck region, specialized nurses require advanced expertise in airway safety, microvascular flap surveillance, tracheostomy and wound care, multimodal analgesia and clinical nutrition. The contribution of specialized nursing extends beyond routine tasks and includes continuous clinical surveillance, early recognition of potential complications and coordination of multidisciplinary care. These activities are important components of patient safety; however, their individual effects on complication rates and treatment outcomes cannot be established by this narrative review alone.

The proposed clinical pathway provides a conceptual framework for integrating specialized nursing interventions across the perioperative continuum, while nursing-sensitive outcomes (NSOs) offer a potential approach to evaluating the quality and impact of nursing care. Advancing specialized education, standardizing clinical pathways and incorporating relevant NSOs into quality assessment may contribute to improving patient safety, functional recovery and quality of life in oral and maxillofacial surgery. Further prospective studies are

needed to assess the feasibility, clinical applicability and effectiveness of these approaches and to clarify their relationships with patient outcomes.

Conflict of Interest Statement

The authors declare no conflict of interest

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