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Review Article

Research Progress on Perioperative Care for Orthopedic Patients with Confirmed Mental Disorders

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Abstract

Perioperative management of orthopedic patients with comorbid mental disorders poses a prominent clinical challenge. Mental disorders and orthopedic trauma interactively exacerbate each other, increasing the incidence of postoperative delirium and extending recovery time. This narrative review searched PubMed, Web of Science and CNKI up to December 2025 with keywords of mental disorders, orthopedic surgery, perioperative nursing and postoperative delirium, to collect clinical studies and practical guidelines. The review elaborates on preoperative risk screening, intraoperative anesthesia protocols and full-cycle perioperative care strategies. By sorting out recent domestic and international evidence, it discusses standardized assessment, neuroprotective effects of regional anesthesia, as well as combined pharmacological and non-pharmacological care pathways. With clinical case support, it highlights the necessity of multidisciplinary collaboration, and provides ideas for developing a complete and standardized perioperative nursing model.

Keywords

Mental Disorders, Orthopedic Surgery, Perioperative Care, Postoperative Delirium, Multidisciplinary Collaboration

1. Introduction

Orthopedic patients frequently present with comorbid mental health issues and psychiatric disorders. Acute trauma and chronic musculoskeletal pain lead to partial impairment of physical and social functioning, significantly reducing the tolerance threshold to surgical stress. The interaction between mental disorders and orthopedic trauma is not merely additive; psychiatric symptoms can impair patients' ability to accurately articulate their pain experience and their adherence to treatment regimens. Severe post-traumatic pain combined with immobilization may further exacerbate psychiatric symptoms, creating a vicious cycle. With the rising global incidence of mental disorders, the number of patients with comorbid psychiatric conditions seeking care in orthopedic outpatient clinics and inpatient wards is increasing steadily, yet scientifically validated, evidence-based comprehensive nursing interventions for both preoperative and postoperative phases remain limited [1]. Nurses, owing to their high involvement in preoperative and intraoperative phases, prolonged patient contact, and comprehensive understanding of the patient's condition, play a pivotal role in risk assessment, symptom early detection,

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and appropriate nursing interventions. Extensive research has been conducted on the refined application of risk assessment scales, the selection of general anesthesia techniques, the implementation of neuroprotective measures, and the evidence-based foundation for nursing interventions. The relevant advancements are summarized as follows.

2. Risk Interaction and Assessment of Mental Disorders in Orthopedic Perioperative Care

This narrative review was conducted by searching databases including PubMed, Web of Science, and China National Knowledge Infrastructure (CNKI) (from database inception to December 2025), using search terms such as "mental disorders,""orthopedic surgery,""perioperative nursing," and "postoperative delirium," to identify clinical studies and guidelines directly relevant to nursing practice.

2.1. Mechanisms by Which Mental Disorders Influence Neurocognitive Outcomes After Orthopedic Surgery

For patients with mental disorders, the primary concerns following orthopedic surgery are postoperative deterioration of the nervous system and cognitive function. Studies indicate that patients with mental disorders or chronic brain diseases face a 3–5 times higher risk of delayed recovery of consciousness after anesthesia compared to other patients, and they exhibit a significantly increased risk—up to 60%—of developing postoperative confusion. Numerous factors contribute to these outcomes [2]. For instance, prolonged use of dopamine receptor blockers, lithium preparations, and benzodiazepines can alter receptor abundance and accelerate neurotransmitter turnover; different types of anesthetics may exert antagonistic effects on the same receptors, leading to either hyperexcitability or excessive sedation. Additionally, excessive neuronal inhibition mediated by γ-aminobutyric acid (GABA), regional ischemia, and mitochondrial dysfunction constitute key mechanisms underlying increased susceptibility to brain injury during the perioperative period in these patients [3]. The specific stimuli associated with orthopedic procedures further elevate patient risk: during bone marrow cavity manipulation, the release of free lipids and inflammatory cytokines can trigger a systemic inflammatory response. This response increases blood-brain barrier permeability, exacerbates neuroinflammation, and elevates the expression of the brain injury biomarker S100B protein. The preexisting neurochemical imbalances in patients with mental disorders significantly compromise their tolerance to this inflammatory cascade. Consequently, perioperative care should prioritize the protection of neurocognitive function as an equally critical objective as the orthopedic procedure itself [4].

2.2. Standardized Screening and Dynamic Assessment of Perioperative Mental Status

Accurate identification of psychiatric symptoms forms the foundation for implementing appropriate nursing interventions. The expert consensus on the assessment and management of mental health issues and mental disorders in the perioperative period of enhanced recovery after surgery (ERAS) orthopedics recommends using structured questionnaires to screen patients' psychological status preoperatively. This encompasses three key aspects: classification of mental disorders and their common features; clinical manifestation screening and evaluation of mental disorders; and perioperative treatment strategies. The Brief Psychiatric Rating Scale (BPRS) should be employed to gauge the severity and progression of psychiatric symptoms. The Delirium Rating Scale (DRS) is utilized for diagnosing and grading postoperative delirium. For orthopedic patients, the Simplified Psychiatric Assessment Questionnaire serves as an effective tool for predicting unfavorable outcomes following lumbar decompression surgery, identifying psychosocial vulnerabilities without compromising assessment efficiency [5]. Dynamic monitoring is of paramount importance in nursing evaluations. Symptoms in patients with mental disorders may manifest differently preoperatively, intraoperatively, and postoperatively: anxiety may present as agitation; depressive symptoms may be misinterpreted as normal postoperative mood fluctuations; and the clinical presentations of hyperactive versus hypoactive delirium differ substantially in nature. Nursing staff should remain vigilant regarding changes in mental status during shift handovers, integrating periodic assessments using standardized scales with bedside behavioral observations to establish a continuous evaluation continuum [6].

2.3. Risk-Driven Nursing Grading Management

Implementing tiered management strategies based on assessment results is an effective approach to enhancing nursing care quality and targeted intervention efficacy. Key risk factors associated with the controllability of postoperative delirium include the use of hypnotic and sedative agents, depressive mood, and polypharmacy, with odds ratios (OR) of 6.42, 4.98, and 2.34, respectively. Nursing hierarchical management should be categorized based on the aforementioned aggregation levels of risk factors. High-risk patients should be included in a multidisciplinary discussion mechanism prior to surgery, with early psychiatric intervention to conduct emotional risk assessments and develop personalized medication and psychological care plans [7]. For the high-risk group, key measures include optimizing the environment, enhancing sleep management, minimizing excessive nighttime disturbances, and ensuring appropriate diurnal light intensity variations to reduce the risk of delirium; whereas for the low-risk group, primary interventions consist of patient education and

encouragement to ambulate as early as possible. Implementing graded patient management aims to focus clinical efforts on the highest-risk patients within limited human and material resources, while ensuring that low-risk patients are not overlooked. The standardization of nursing documentation is a critical component in implementing graded nursing care; it ensures that psychiatric and behavioral assessment results, nursing interventions, and nursing outcomes are comprehensively documented in nursing records, thereby providing valuable reference information for subsequent revisions of nursing care plans [8].

3. Nursing Coordination for Anesthesia Selection and Perioperative Medication Management

3.1. Neuroprotective Advantages of Regional Anesthesia

The choice of anesthesia modality is one of the critical factors influencing the perioperative neurological prognosis of patients with mental disorders undergoing orthopedic surgery. The underlying mechanism is that general anesthesia may exacerbate preexisting cerebral vulnerability, potentially converting transient central nervous system suppression into permanent central nervous system damage. In contrast, local anesthetics and spinal anesthesia do not compromise the autoregulation of cerebral blood flow, can reduce fluctuations in intracerebral chemical concentrations, and are associated with lower rates of delirium, faster recovery, and improved hemodynamic stability. For patients with mental disorders or unstable cerebral function, regional anesthesia performed under conscious or mild sedation offers the advantages of enabling continuous neurological monitoring and facilitating patient communication, thereby holding potential value in reducing the risk of undetected neurological impairment during surgery.

3.2. Key Nursing Considerations

The most crucial aspect of nursing coordination is the accurate preoperative assessment of the patient's cognitive status and degree of cooperation. For patients exhibiting significant psychiatric symptoms or excessive anxiety who struggle to maintain surgical positioning, a joint evaluation by the nursing team and the anesthesiologist is essential to determine the patient's level of cooperation. Postoperatively, the focus of nursing care shifts to neurological monitoring during the period of potential anesthetic sequelae. The time required for the resolution of limb numbness and weakness following local anesthetic block varies among individuals; however, patients with mental disorders may not accurately or comprehensively describe these abnormal sensations. Nurses should therefore integrate physical examination findings with behavioral observations for a comprehensive analysis [9].

3.3. Perioperative Adjustment and Nursing Monitoring of Antipsychotic Medications

The management of antipsychotic medications constitutes a paramount priority in perioperative nursing care. Patients undergoing long-term antipsychotic therapy face risks of perioperative dose reduction or even discontinuation of medication, as well as the need for concomitant drug therapy. Abrupt dose reduction or withdrawal of psychotropic agents may exacerbate neurotransmitter imbalances during the perioperative period and increase the incidence of adverse reactions to anesthetics; conversely, prolonged use of these agents may lead to interactions with other anesthetic drugs. Short-term, low-dose use of olanzapine in patients undergoing their first total hip or total knee arthroplasty can reduce the incidence of perioperative anxiety and sleep disturbances, while also decreasing postoperative opioid requirements. A randomized controlled trial involving 400 patients undergoing hip or knee arthroplasty demonstrated that a single dose of olanzapine administered during the perioperative period reduced the incidence of delirium from 40.2% to 14.3%. Key evaluation endpoints included: monitoring changes in psychiatric symptoms post-treatment; identifying early warning signs of extrapyramidal symptoms; and assessing interactions between medications and analgesic regimens. Psychiatric consultation nurses or orthopedic nurses with specialized psychiatric training serve as critical liaisons between patients and psychiatrists; in this role, they play a pivotal part in monitoring medication adherence rates, identifying adverse drug reactions within the ward setting, and providing timely feedback to psychiatrists. The precision of medication management protocols directly correlates with the stability of psychiatric symptoms and the efficacy of postoperative delirium prevention [10].

3.4. Synergistic Management of Psychiatric Symptoms and Pain

Psychiatric symptoms and pain can mutually exacerbate each other. Inadequate control of postoperative pain may worsen anxiety and agitation; furthermore, patients with mental disorders may exhibit distinct perceptions and expressions of pain compared to general patients, complicating pain assessment [11]. Therefore, the multimodal analgesia protocol implemented under ERAS guidelines also requires appropriate adjustments for patients with mental disorders. Employing continuous intravenous analgesic infusion to manage pain induced by surgical trauma can mitigate the impact of stressors on psychiatric status; however, the use of sedatives must adhere to the principle of "awake sedation"—controlling acute agitation while preserving patient-environment interaction, and avoiding excessive sedation that may mask signs of neurological deterioration. In nursing assessment, it is crucial to distinguish between pain-related behaviors and behavioral manifestations of psychiatric symptoms: the former exhibit precise somatic localization and temporal specificity, whereas

the latter may present as agitation or withdrawal behaviors without an obvious cause [5]. For each analgesic administration, nurses should simultaneously document pain scale scores and psychiatric status, and complete a combined pain and psychiatric status assessment form, which facilitates the development of tailored, individualized analgesic strategies [3].

4. Nursing Intervention System Within a Multidisciplinary Collaboration Framework

4.1. Construction of Preoperative Psychological Preparation and Treatment Adherence

Preoperative psychological nursing aims to foster patients' confidence in undergoing surgical treatment and cultivate a cooperative attitude. The reasons why patients with mental disorders may resist clinical interventions by healthcare professionals can stem from the impact of their own symptoms, or may also arise from repeated negative experiences in healthcare settings, leading to feelings of aversion [12]. Nursing-led preoperative emotional management can enhance patients' intraoperative satisfaction. Preoperative visits should not be conducted in a rigid, information-dense manner; instead, they should be carried out in a non-stimulating, gradual approach, facilitated by a designated nurse who progressively builds rapport with the patient. For patients exhibiting persecutory delusions or command hallucinations, healthcare providers should, under the guidance of a psychiatrist, tailor the content of communication—avoiding direct denial of the patient's experiences—instead focusing on establishing a safe environment and providing behavioral role models to reduce defensive behaviors [13]. The duration of preoperative psychological preparation should be appropriately extended to allow patients sufficient time to adapt to hospitalization and interaction with nursing staff. Family members or caregivers play a pivotal role in fostering treatment adherence; healthcare professionals should integrate family members into preoperative education sessions, teaching them essential postoperative safety precautions and appropriate ways to cooperate.

4.2. Prevention and Safe Nursing Care for Postoperative Delirium

The prevention of postoperative delirium represents the area with the most robust evidence-based support for nursing interventions. Integrated nursing interventions—including psychological counseling, environmental care, individualized pain management, patient education, standardized rehabilitation guidance, and support for daily living activities—have demonstrated significant benefits in alleviating depression and anxiety, sleep disturbances, and pain. In terms of delirium prevention, this approach constitutes the most cost-effective intervention strategy. Within the ward environment, minimizing auditory and visual stimuli, maintaining a consistent day-night cycle, providing familiar objects, and encouraging family visits can reduce the incidence of delirium without requiring additional use of antipsychotic medications. Safe nursing care constitutes the fundamental requirement for nursing practice once delirium has occurred. Due to impaired consciousness, patients with delirium may exhibit behaviors such as self-harm, harming others, unplanned extubation, falls, or falling out of bed; therefore, nursing staff must implement appropriate protective measures to prevent accidental injuries. The implementation of these protective measures requires striking a balance between safety and dignity; restrictive measures should be employed only as a last resort and under continuous assessment, with strict time limits. The completeness of nursing records holds dual significance—both legally and in quality management—for the prevention of adverse events.

4.3. Functional Training and Dynamic Adjustment of Mental Status in Rehabilitation Nursing

The rehabilitation progress of patients should be dynamically adjusted in accordance with their emotional fluctuations. The "golden window" for postoperative orthopedic rehabilitation is critical for functional recovery; however, patients may fail to complete prescribed rehabilitation tasks due to emotional changes. In the early stages, interventions may begin with bedside ankle pump exercises, assisted back percussion, and assisted turning, gradually progressing to sitting, standing, and ambulation with crutches. At the beginning of each daily rehabilitation exercise session, nurses conduct a brief assessment of the patient's psychological status; if the patient's psychological state is deemed unsuitable, the intensity of the exercises is temporarily reduced. During episodes of mania, nurses avoid hastily increasing the exercise volume to prevent emotional fluctuations following unsuccessful attempts from leading the patient to refuse exercise. They set small, achievable goals and work toward them sequentially; completing each exercise task serves as an affirmation of the patient's self-confidence. The psychiatric and psychological support team provides comprehensive intervention throughout the rehabilitation phase, including patient assessment, adjustment of antipsychotic medication dosages, and targeted psychotherapy and behavioral interventions, thereby helping patients maintain a positive emotional state and high medication adherence throughout their prolonged rehabilitation period. The goal of rehabilitation nursing care is to facilitate maximal functional improvement in patients whose psychiatric symptoms have been largely under control.

5. Concluding Remarks

Perioperative nursing care for orthopedic patients with mental disorders is transitioning from an experience-based

model to evidence-based practice. Current research focuses on: how to conduct localized re-evaluation of commonly used risk assessment scales; how to better integrate regional block anesthesia techniques with nursing interventions; and how to incorporate nursing procedures into multidisciplinary treatment pathways. Nurses should not merely serve as assistants to physicians; instead, they should exercise proactive initiative in managing patients with mental disorders—particularly in monitoring disease progression and identifying risk factors, promptly detecting potential safety hazards, and appropriately regulating the pace of recovery. In summary, when a patient with a mental disorder is in a stable condition, each step of the enhanced recovery after surgery (ERAS) protocol represents a crucial strategy for elevating the overall quality of perioperative care for such patients.

Abbreviations

BPRS	Brief Psychiatric Rating Scale
DRS	Delirium Rating Scale
ERAS	Enhanced Recovery After Surgery
GABA	γ-aminobutyric Acid
OR	Odds Ratio
BCW	Behavior Change Wheel
CNKI	China National Knowledge Infrastructure

Author Contributions

Xia Lin: Conceptualization, Methodology, Writing – original draft

Li Ai: Data curation, Resources, Writing – review & editing

Conflicts of Interest

The authors declare no conflicts of interest.

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