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A Multidimensional Mental Health Nursing Intervention to Improve Psychological and Postoperative Recovery Outcomes: A Comprehensive Review

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ABSTRACT: Background: Surgery is a physiological and psychological stressor. Perioperative anxiety, depressive symptoms and pain catastrophizing activate neuroendocrine and inflammatory pathways that are associated with poorer wound healing, higher analgesic need and slower recovery. Mental health support is nevertheless inconsistently integrated into perioperative nursing care.

Objective: To synthesize evidence on nurse-deliverable psychological interventions in the surgical pathway and to propose a multidimensional mental health nursing intervention for improving psychological and postoperative recovery outcomes.

Methods: A critical narrative review was conducted across PubMed/MEDLINE, CINAHL, PsycINFO, Scopus and the Cochrane Library. Evidence was synthesized thematically into six intervention domains and a four-phase delivery pathway.

Key Findings: Preoperative anxiety affects roughly half of surgical patients worldwide. Compassion-based interventions show large pooled effects on perioperative anxiety ($g = -0.95$) and depression ($g = -0.82$). Cognitive-behavioural strategies, relaxation, guided imagery and music are associated with lower anxiety, pain and analgesic use, although benefits in oncological surgery have not always persisted after discharge.

Conclusion: Combining screening, psychoeducation, cognitive-behavioural strategies, mind-body relaxation, sensory comfort and compassionate communication across the

preoperative, intraoperative, postoperative and discharge phases offers a feasible, nurse-led framework. Pragmatic trials are needed to test its effect on recovery outcomes.

INTRODUCTION AND THEORETICAL FOUNDATIONS

Surgery is one of the most common planned stressors that people encounter. It is experienced as a threat to bodily integrity, independence and, for many patients, to life itself. Preoperative anxiety is therefore frequent: a global systematic review and meta-analysis reported a pooled prevalence of about 48% among surgical patients (Abate et al., 2020), and higher figures have been reported in particular settings and procedures. Anxiety and depression are not only distressing states. Depression has been associated with postoperative complications (Ghoneim & O'Hara, 2016), and psychological distress has been linked to slower recovery trajectories.

The biological pathways connecting distress to recovery are described by psychoneuroimmunology. Anticipatory stress activates the sympathetic-adrenal-medullary (SAM) axis and the hypothalamic-pituitary-adrenal (HPA) axis, increasing circulating catecholamines and glucocorticoids. These changes can alter inflammatory signaling, reduce tissue perfusion through vasoconstriction, and suppress aspects of cell-mediated immunity. Psychological stress has been shown to influence wound repair and immune function (Kiecolt-Glaser et al., 1998). Distress also amplifies pain perception and catastrophizing, which can increase analgesic requirements. Figure 1 summarizes these proposed pathways.

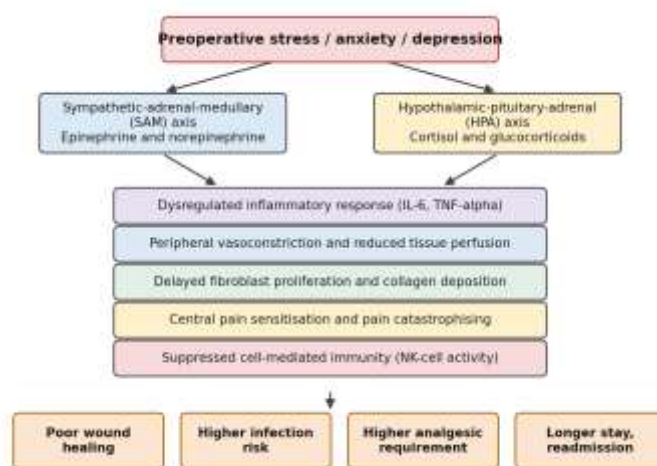


Figure 1. Proposed pathways linking perioperative psychological distress to adverse recovery outcomes (conceptual synthesis by the authors).

Modern perioperative care has made substantial progress on the somatic side. Multimodal analgesia, carbohydrate loading, goal-directed fluid therapy and early mobilization form the core of Enhanced Recovery After Surgery (ERAS) pathways (Kehlet, 1997; Ljungqvist et al., 2017). Psychological preparation, however, often remains limited to brief information leaflets or a single reassuring conversation. Nurses are well placed to close this gap. They meet patients in the pre-admission clinic, the holding area, the operating theatre, the post-anesthesia care unit (PACU), the ward and, increasingly, at follow-up.

Several theoretical perspectives support a nurse-led psychological approach. The biopsychosocial model holds that illness and recovery are shaped jointly by biological, psychological and social factors (Engel, 1977). Cognitive appraisal theory proposes that stress depends on whether a person judges a situation to exceed their coping resources (Lazarus & Folkman, 1984), and self-efficacy theory explains why building confidence in one's ability to cope changes behavior (Bandura, 1977). Kolcaba's Comfort Theory (Kolcaba, 2003) and Watson's Theory of Human Caring (Watson, 2008) frame the nurse's role as providing comfort across physical, psychospiritual, environmental and sociocultural contexts. Taken together, these frameworks suggest that nurses can reduce threat appraisal, strengthen coping and provide comfort at each stage of the surgical journey.

Most published studies test one technique at a time, such as music or relaxation. This review instead integrates the evidence into a **multidimensional mental health nursing intervention** with six domains, delivered through a four-phase pathway.

The review focuses on adult surgical patients, with notes on obstetric and gynecological populations where evidence exists. Pediatric surgery is outside its scope because it requires developmentally specific approaches.

REVIEW METHODOLOGY

Design

A critical narrative review was undertaken. Reporting was guided by the Scale for the Assessment of Narrative Review Articles (SANRA) (Baethge et al., 2019). A narrative design was chosen because the interventions, surgical populations and outcome measures differ too widely for a single pooled analysis.

Search strategy

PubMed/MEDLINE, CINAHL, PsycINFO, Scopus and the Cochrane Library were searched for records published from **2026** to **August**. Search terms combined surgical context (perioperative, preoperative, postoperative, surgery), psychological outcome (anxiety, depression, distress, psychological), nursing context (nurse, nurse-led, nursing) and intervention terms (psychoeducation, cognitive behavioral, relaxation, guided imagery, music, mindfulness, biofeedback, compassion). Reference lists of key reviews and trial protocols were hand-searched.

Eligibility criteria

- **Included:** randomized and quasi-experimental trials, systematic reviews and meta-analyses, major trial protocols, and foundational theoretical sources; adult surgical patients; psychological, educational or sensory interventions that nurses can deliver or co-deliver; outcomes of anxiety, depression, pain, analgesic use or recovery.
- **Excluded:** purely pharmacological interventions, pediatric-only studies, conference abstracts, editorials and opinion pieces without data.

Synthesis

Findings were grouped thematically into intervention domains. Effect sizes are reported as published by the original authors; no new pooled analysis was performed, and no formal risk-of-bias grading was applied. These choices are acknowledged as limitations in a later section.

THE MULTIDIMENSIONAL MENTAL HEALTH NURSING INTERVENTION: CONCEPTUAL MODEL

The proposed model combines six complementary domains (Figure 2). Each targets a different part of the stress-recovery pathway: the patient's appraisal of surgery, their physiological arousal, their sensory environment and their relationships with the care team and family. Table 1 summarizes the nursing actions, the proposed mechanism and the supporting evidence for each domain.

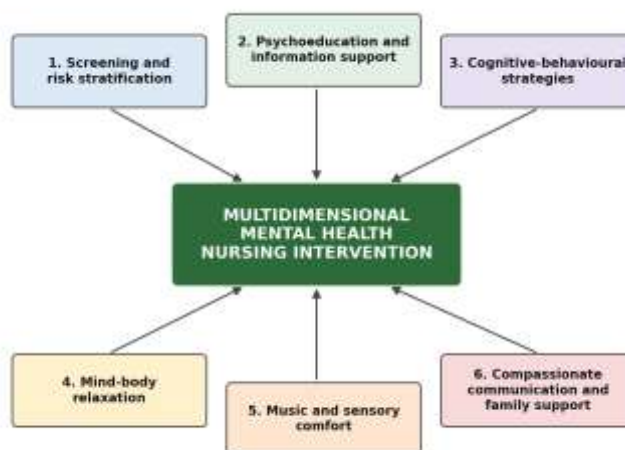


Figure 2. Conceptual model of the multidimensional mental health nursing intervention.

Table 1. Domains of the multidimensional mental health nursing intervention

Domain	Core nursing actions	Proposed mechanism	Supporting sources
1. Screening and risk stratification	Administer brief validated tools at pre-admission; assign risk tier; flag high-risk patients for targeted care	Early identification of vulnerable patients; matches intensity of support to need	Moerman et al., 1996; Zigmond & Snaith, 1983; Spielberger et al., 1983; Sullivan et al., 1995
2. Psychoeducation and information support	Explain procedures, anaesthesia, pain control and recovery milestones; explain why early mobilization matters	Reduces uncertainty and threat appraisal; supports adherence to recovery pathways	Kehlet, 1997; Ljungqvist et al., 2017; Moerman et al., 1996
3. Cognitive-behavioural strategies	Identify catastrophic thoughts, test them against facts, build coping self-statements, plan activities	Alters appraisal; builds self-efficacy	Abraham et al., 2022; Holzer et al., 2024b; Bandura, 1977
4. Mind-body relaxation	Teach progressive muscle relaxation, slow breathing and guided imagery before surgery; reinforce afterwards	Lowers sympathetic arousal and muscle tension	Jacobson, 1938; Manyande et al., 1995
5. Music and sensory comfort	Offer patient-selected music with headphones; reduce avoidable noise in holding area and PACU	Distraction and autonomic calming	Bradt et al., 2013; Hole et al., 2015
6. Compassionate communication and family support	Personalized, unhurried communication; involve family or birth partner; acknowledge emotions	Builds trust and felt safety; addresses psychosocial needs	Holzer et al., 2024a; Kolcaba, 2003; Watson, 2008; Watt et al., 2017

Domain 1: Screening and risk stratification

Pre-anaesthesia assessment traditionally concentrates on cardiorespiratory risk. Adding a brief psychological screen allows nurses to identify patients who are likely to need more support. Four instruments are suitable for pre-admission use. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) is a six-item tool that measures anxiety about anesthesia and surgery together with the patient's need for information (Moerman et al., 1996). The State-Trait Anxiety Inventory (STAI) quantifies situational anxiety (Spielberger et al., 1983). The Hospital Anxiety and Depression Scale (HADS) screens for anxiety and depression while limiting the influence of somatic symptoms (Zigmond & Snaith, 1983). The Pain Catastrophizing Scale (PCS) captures rumination, magnification and helplessness about pain (Sullivan et al., 1995). Local cut-off scores for triage should be agreed within each institution.

Domain 2: Psychoeducation and information support

Information is most useful when it is tailored to what the patient wants to know. The information-need subscale of the APAIS helps nurses to separate patients who need more detail from those who prefer less (Moerman et al., 1996). Education should connect physiological instructions to their purpose, for example explaining that early walking helps to prevent chest and circulatory complications. This links psychological preparation directly to ERAS elements such as early mobilization and early oral intake (Kehlet, 1997; Ljungqvist et al., 2017). Teach-back, written summaries and audio or video resources can reinforce understanding.

Domain 3: Cognitive-behavioural strategies

Brief nurse-delivered cognitive-behavioural strategies follow three steps. First, the nurse helps the patient to name catastrophic thoughts, such as “I will not wake up after anaesthesia” or “the pain will be unbearable.” Second, the nurse provides accurate facts to test these thoughts, including continuous monitoring during surgery and the availability of staged pain relief. Third, the patient is guided to adopt realistic coping statements, such as “pain is expected, temporary and treatable.” Behavioural activation, which plans small, achievable activities for recovery, is a further component. Perioperative programs that combine behavioural activation with care coordination and medication optimization have been developed and tested in older surgical patients (Abraham et al., 2022; Holzer et al., 2024b). These programs are not nurse-only interventions, but their behavioural components can be adapted for nursing delivery.

Domain 4: Mind-body relaxation

Progressive muscle relaxation, introduced by Jacobson (1938), teaches patients to tense and then release muscle groups in sequence. Slow diaphragmatic breathing with a longer exhalation than inhalation can be practiced in the holding area to reduce arousal immediately before surgery. Guided imagery uses multisensory mental rehearsal of a calm setting or of a comfortable recovery. In a controlled study, preoperative rehearsal of active coping imagery diminished subjective and neuroendocrine responses to surgical stress (Manyande et al., 1995). Audio recordings allow patients to practice at home before admission and to continue after surgery.

Domain 5: Music and sensory comfort

Operating-theatre and PACU environments contain alarms, equipment noise and rapid conversation that can maintain arousal in awake or lightly sedated patients. Music listening is a low-risk intervention that nurses can offer. A Cochrane review found that music listening can reduce preoperative anxiety (Bradt et al., 2013), and a later systematic review and meta-analysis reported that music reduces postoperative pain, anxiety and analgesic requirements (Hole et al., 2015). Practical steps include allowing patients to choose their own music, using headphones, and lowering avoidable noise in the holding area and PACU.

Domain 6: Compassionate communication and family support

Compassion-based interventions emphasize enhanced communication, emotional support and individualized attention from clinicians. A systematic review of 25 randomized controlled trials in adult surgical patients, with meta-analyses of 14 studies for anxiety and 9 for depression, found large effects on anxiety ($g = -0.95$) and depressive symptoms ($g = -0.82$); interventions reduced anxiety or depression in 72% of the included studies (Holzer et al., 2024a). Compassionate care is central to nursing theory (Kolcaba, 2003; Watson, 2008) and requires little equipment, which makes it highly scalable. In obstetric surgery, cross-sectional data show that anxiety is common among women undergoing caesarean section (Ferede et al., 2022), which supports calm narration of each step, a supportive companion where policy allows, and early skin-to-skin contact when the mother and baby are stable. In specialized gynaecological populations affected by stigma, a nurse-delivered mental health intervention for women with obstetric fistula in Tanzania showed promising results in a pilot randomized trial (Watt et al., 2017).

EVIDENCE ON PSYCHOLOGICAL AND POSTOPERATIVE RECOVERY OUTCOMES

Psychological outcomes

The most consistent finding across domains is a reduction in anxiety and depressive symptoms around the time of surgery. The compassion-based meta-analysis described above is the clearest quantitative example (Holzer et al., 2024a). A separate narrative synthesis and meta-analysis restricted to oncological surgery found that psychological and pharmacological interventions reduced preoperative anxiety (Hedges' $g = -1.03$) and depression at hospital discharge ($g = -0.88$) (Abraham et al., Anaesthesia).

Pain and analgesic use

Music interventions are associated with lower postoperative pain and analgesic requirements (Hole et al., 2015), and guided imagery rehearsal has been associated with reduced neuroendocrine stress responses (Manyande et al., 1995). Pain catastrophizing, measurable with the PCS (Sullivan et al., 1995), offers a modifiable target. Nurse-delivered cognitive and relaxation strategies are theoretically well suited to this target, although high-quality trials of nursing-delivered packages are still limited.

Recovery and functional outcomes

Links between psychological preparation and measures such as length of stay, time to mobilization and wound complications are plausible, given the pathways in Figure 1 and the importance of patient engagement in ERAS (Kehlet, 1997; Ljungqvist et al., 2017). The direct evidence, however, is less consistent than the evidence for anxiety and pain and often comes from small or single-centre studies. This is a priority gap for future trials.

Durability of effects

The oncological meta-analysis noted above also found that benefits did not persist at later postoperative time points (Abraham et al., Anaesthesia). This finding is important for design. A pre-surgery-only intervention may be insufficient. It supports extending psychological support through the PACU, ward and discharge phases, as proposed in the pathway below.

IMPLEMENTATION: A FOUR-PHASE NURSE-LED PATHWAY

To deliver the six domains without overloading acute care staff, the pathway uses risk tiering. All patients receive a standard package of education, a relaxation recording and a music option. Patients with scores above locally agreed thresholds receive a targeted package with additional cognitive-behavioral sessions, structured follow-up and, when indicated, referral to a psychiatric liaison service. Figure 3 shows the four phases and Table 2 suggests outcome measures and timing for evaluation.



Figure 3. Four-phase, risk-stratified nurse-led pathway for delivering the multidimensional intervention.

Table 2. Suggested outcome measures for evaluating the pathway

Outcome	Suggested instrument or source	Suggested timing
Anxiety and information need	APAIS	Pre-admission and day of surgery
State anxiety	STAI-State	Before induction; before discharge
Anxiety and depressive symptoms	HADS	Pre-admission; discharge; follow-up

Outcome	Suggested instrument or source	Suggested timing
Pain catastrophizing	Pain Catastrophizing Scale	Pre-admission; repeat if high
Pain intensity	Numeric rating scale (0–10)	PACU and each shift
Analgesic consumption	Medication administration records	First 72 hours
Recovery process	Time to first ambulation; length of stay	From hospital records
Patient experience	Satisfaction questionnaire	Discharge; follow-up call

IMPLEMENTATION CHALLENGES AND SYSTEMIC BARRIERS

- **Time and staffing:** surgical nurses carry heavy medication, wound care and documentation loads. Delivering 20 to 30 minute sessions requires protected time, task redistribution or brief formats.
- **Somatic bias:** acute surgical environments prioritize measurable physical parameters, and psychological distress may be treated as an expected side effect of surgery rather than a modifiable risk factor.
- **Training gaps:** mental health content in nursing curricula is often confined to psychiatric placements, leaving surgical nurses with limited preparation in cognitive reframing, relaxation facilitation and de-escalation.
- **Contextual fit:** languages, cultural attitudes to mental health and family roles vary. Materials should be translated and adapted, and family involvement planned with local norms in mind.
- **Measurement burden:** repeated questionnaires add workload. Using short tools and integrating them into electronic records can help.

LIMITATIONS OF THE EVIDENCE AND OF THIS REVIEW

The design of this review has limitations. It is a narrative synthesis without formal risk-of-bias assessment or new pooled analysis, so conclusions are qualitative. Many included trials involve single interventions, small samples and short follow-up, and few were delivered exclusively by nurses. Evidence on hard recovery outcomes such as length of stay is weaker than evidence on anxiety and pain. The proposed model is conceptual: the six domains and four phases have not yet been tested together as a package, and the thresholds for risk tiering need local validation. Publication bias and language restrictions may also have influenced the evidence base.

IMPLICATIONS FOR PRACTICE, EDUCATION, RESEARCH AND POLICY

- **Practice:** add a brief psychological screen to pre-admission assessment, and offer all patients a standard package of education, relaxation and music. Reserve intensive sessions for those at higher risk.
- **Education:** include perioperative mental health skills in undergraduate and in-service training, with simulation of reframing conversations and relaxation coaching.
- **Research:** conduct pragmatic or stepped-wedge trials of the full multidimensional package, with nurse-delivered intervention, patient-reported outcomes and recovery measures; follow patients beyond discharge; include economic evaluation; report adaptation for low- and middle-income settings.
- **Policy:** treat perioperative mental health screening and psychological preparation as quality indicators alongside infection and readmission rates, and protect nursing time for their delivery.

CONCLUSION

Perioperative psychological distress is a common and modifiable influence on how patients experience surgery and recover from it. The evidence supports nurse-deliverable approaches that reduce anxiety, depressive symptoms and pain, with

compassion-based communication showing particularly large effects on anxiety and depression. Because benefits in some populations have not been sustained after discharge, support should continue across the whole surgical pathway. The multidimensional model proposed here combines screening, psychoeducation, cognitive-behavioural strategies, mind-body relaxation, sensory comfort and compassionate communication in a risk-stratified, four-phase pathway. Rigorous trials of this integrated package are now needed to establish its effect on psychological and postoperative recovery outcomes.

DECLARATIONS

Author contributions:

Dr. Lekha Bist conceptualized the overall research direction and provided academic supervision and critical intellectual input. **Ritu** conceptualized the review, developed the multidimensional mental health nursing intervention model, led the literature search and synthesis, and prepared the original manuscript draft. **Anshika Rosha** contributed to the literature search, screening and extraction of relevant studies, and drafting of the evidence synthesis. **Vinod Bhatt** contributed to the theoretical framework and the development of the four-phase nursing pathway and critically reviewed the manuscript. **Adil Hussain** contributed to the interpretation and synthesis of the literature and the critical revision of the manuscript. **Rachna Bisht** contributed to the preparation of tables and figures, verification of references, and manuscript editing. **Aliya Hussain** contributed to reviewing the relevant literature, organizing the evidence, and revising the manuscript for intellectual content. **Diksha Kaushal** contributed to the critical review of the manuscript, refinement of the nursing implications, and final editorial revisions. All authors reviewed and approved the final version of the manuscript.

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