

A COMPARATIVE REVIEW OF PSYCHOLOGICAL INTERVENTIONS FOR STRESS AND ANXIETY IN SURGICAL PATIENTS: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Surgery is a potent psychological and physiological stressor. Prevalence estimates for clinically significant preoperative anxiety vary widely by setting and instrument, from as low as 11.8% in a Tanzanian tertiary hospital using the Amsterdam Preoperative Anxiety and Information Scale (Msoma et al., 2023) to 40-90% in several Euro-American cohorts, with pooled multi-country estimates commonly cited near 60-80%. Elevated anxiety is associated with heightened cortisol and inflammatory responses, elevated anaesthetic and analgesic requirements, higher odds of postoperative delirium, delayed wound healing, and prolonged recovery (Shebl et al., 2025; Villa et al., 2020). A wide range of psychological interventions - psychoeducation, relaxation and guided imagery, mindfulness-based practices, cognitive-behavioural therapy (CBT), and music therapy - have been trialled to reduce this burden, yet comparative evidence on their relative effectiveness remains fragmented, particularly outside high-income settings.

Objective: To systematically review and comparatively synthesise randomised and quasi-experimental evidence, together with existing systematic reviews and meta-analyses, on the effectiveness of psychological interventions in reducing stress and anxiety and improving postoperative recovery outcomes among adult surgical patients, and to situate this evidence within its underlying neuroendocrine and inflammatory mechanisms and its generalisability across high, middle- and low income surgical settings.

Methods: This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines. PubMed/MEDLINE, Scopus, CINAHL, PsycINFO, and Cochrane CENTRAL were the primary databases for the eligibility-defined search, supplemented by hand-searching of the reference lists of two closely related systematic reviews from the same research group (Villa et al., 2020; Lanini et al., 2022) and of a 2025 meta-analysis of anxiety-outcome associations (Shebl et al., 2025). Randomised controlled trials, pilot RCTs, prospective observational/predictor studies, and systematic reviews/meta-analyses published in English that evaluated a non-pharmacological psychological intervention, or the association between preoperative anxiety and surgical outcomes, in adult elective (or, where explicitly subgrouped, paediatric) surgical patients were eligible. Two reviewers were to independently screen records, extract data using a standardised form, and appraise risk of bias using the Cochrane RoB 2 tool for trials, the Newcastle-Ottawa Scale for observational studies, and AMSTAR-2 for existing reviews. Findings were synthesised narratively and grouped by intervention category, with studies additionally tabulated in chronological order to trace the evolution of the evidence base from 1980 to 2026.

Results: Evidence drawn from primary trials and existing systematic reviews/meta-analyses across psychoeducation, relaxation/guided imagery, mindfulness-based interventions, CBT, and music therapy consistently favoured active psychological intervention over standard care for reducing preoperative state anxiety, with standardised mean differences generally in the

small-to-moderate range (approximately -0.3 to -0.9) and larger, more consistent effects for music-based and mindfulness-based interventions than for single-session verbal psychoeducation. Guided imagery and relaxation training additionally reduced serum cortisol and favourably shifted lymphocyte subsets and inflammatory markers (Felix et al., 2018; Lanini et al., 2022; Villa et al., 2020). A 2025 meta-analysis of 24 studies (n=3,388) demonstrated that anxiety itself is associated with clinically significant downstream consequences, including increased anaesthetic (SMD 0.67) and analgesic (SMD 0.89-1.02) consumption, higher odds of adult postoperative delirium (OR 1.89-2.03), and prolonged recovery time (Shebl et al., 2025), strengthening the clinical rationale for intervention. Prevalence and predictor data from Tanzania (Msoma et al., 2023) and India (Bagle et al., 2024) indicated that both the burden of anxiety and the relative effectiveness of intervention format (verbal versus multimedia; economic/insurance status) vary substantially by health-system context. Comparative head-to-head trials directly contrasting two or more psychological interventions within the same sample remained scarce, especially outside high-income settings.

Conclusion: Structured psychological interventions produce measurable, clinically meaningful reductions in surgical stress and anxiety, and anxiety itself is now linked to objectively measurable adverse events such as delirium and prolonged recovery, elevating the clinical urgency of routine screening and intervention. Multicomponent and culturally adapted, low-literacy-appropriate delivery formats show the most promise for resource-constrained settings such as India and East Africa. Comparative, adequately powered trials evaluating multiple interventions within the same surgical population, across diverse economic and cultural contexts, are needed to guide the integration of psychological care into routine perioperative protocols

KEYWORDS: Preoperative Anxiety; Surgical Stress; Psychological Intervention; Psychoeducation; Relaxation Therapy; Mindfulness; Cognitive-Behavioural Therapy; Postoperative Delirium; Systematic Review; PRISMA.

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