

# Postoperative Anxiety and Depression: Risk Factors and Recovery Trajectories

Alimirzayev N.A.

Teacher of the Department of Pedagogy and psychology, Tashkent State Medical University, Uzbekistan

Burxonova M.U.

Group 213, Tashkent State Medical University, Uzbekistan

Madirimov N.N.

Group 213, Tashkent State Medical University, Uzbekistan

Rixsiboyeva S.I.

Group 213, Tashkent State Medical University, Uzbekistan

**Received:** 28 February 2026; **Accepted:** 25 March 2026; **Published:** 17 April 2026

**Abstract:** This article examines postoperative anxiety and depression, focusing on the primary risk factors contributing to their development and the trajectories of psychological recovery following surgical interventions. The study is based on the analysis of contemporary scientific literature, as well as methods of synthesis, comparison, and generalization. Additionally, clinical observations and patient-reported outcomes are considered as supplementary sources. The analysis indicates that major risk factors include preoperative psychological status, severity of surgical trauma, postoperative pain, neuroendocrine stress response, inadequate social support, and prolonged hospitalization. The findings emphasize the importance of early psychological screening, multidisciplinary care, and structured rehabilitation programs to improve recovery outcomes and patient quality of life.

**Keywords:** Postoperative anxiety, depression, risk factors, psychological recovery, stress response, pain, rehabilitation, mental health.

**Introduction:** In modern clinical practice, postoperative psychological complications, particularly anxiety and depression—are increasingly recognized as key determinants of patient outcomes. Research indicates that up to 30–50% of surgical patients experience significant emotional distress after procedures, which may persist if not properly managed [1]. These disturbances negatively affect not only mental well-being but also wound healing, immune response, and adherence to treatment protocols [2].

This issue is especially relevant in patients undergoing major surgical procedures. Surgical trauma activates complex physiological stress mechanisms, including

inflammatory and neuroendocrine responses, which influence brain function and emotional regulation [3]. As a result, patients often experience fear, uncertainty, and depressive symptoms during the postoperative period.

The phenomenon of postoperative anxiety and depression has been extensively studied within clinical psychology, psychiatry, and perioperative medicine. It is closely linked to individual coping mechanisms, stress resilience, and biological responses such as cortisol secretion and neurotransmitter imbalance [4]. Therefore, assessing risk factors and recovery trajectories is of significant clinical importance. The

primary aim of this study is to identify key risk factors contributing to postoperative anxiety and depression and to analyze patterns of psychological recovery based on current scientific evidence.

## METHODS

The study employed methods including literature review, comparative analysis, systematization, and synthesis. Peer-reviewed articles, randomized clinical trials, and international medical guidelines published in recent years were analyzed. Special emphasis was placed on studies examining biopsychosocial interactions in postoperative recovery. Data from patient-reported outcome measures (PROMs), longitudinal cohort studies, and meta-analyses were also included to strengthen the evidence base [5].

## RESULTS

The analysis shows that postoperative anxiety and depression are multifactorial conditions influenced by interconnected biological, psychological, and social factors. One of the strongest predictors is preoperative psychological status. Patients with pre-existing anxiety or depressive disorders are significantly more likely to develop postoperative emotional complications due to maladaptive coping strategies and heightened stress sensitivity [6].

Postoperative pain is another major contributing factor. Uncontrolled pain activates the hypothalamic-pituitary-adrenal (HPA) axis, increasing cortisol levels and intensifying emotional distress [7]. Studies show that effective pain management reduces both anxiety and depressive symptoms, highlighting the interaction between physical and psychological processes [8]. The severity and type of surgery also influence psychological outcomes. Invasive and high-risk procedures are associated with greater emotional burden due to increased uncertainty, longer recovery periods, and higher complication rates [9]. Inflammatory responses following surgery play a crucial role. Elevated levels of cytokines such as IL-6 and TNF- $\alpha$  have been linked to depressive symptoms, suggesting a biological mechanism underlying postoperative mood disorders [10].

Sleep disturbances are another significant factor. Postoperative patients often experience disrupted sleep patterns, which negatively affect emotional regulation and increase vulnerability to anxiety and depression [11]. Social support has been consistently identified as a protective factor. Patients with strong interpersonal relationships demonstrate better emotional stability and faster recovery compared to those experiencing social isolation [12]. Prolonged hospitalization and postoperative complications further increase psychological distress. Patients may

develop feelings of helplessness, reduced autonomy, and fear regarding long-term health outcomes [13]. Cognitive factors also contribute significantly. Catastrophic thinking, fear of complications, and low self-efficacy are associated with higher levels of anxiety and depression [14]. Recovery trajectories vary among individuals. Some patients recover within a few weeks, while others develop persistent symptoms that may progress into chronic mood disorders if untreated [15]. Early psychological intervention significantly improves recovery outcomes [16].

## DISCUSSION

The findings confirm that postoperative anxiety and depression should be understood within a biopsychosocial framework. Biological stress responses, including neuroendocrine activation and inflammation, interact with psychological and social variables to determine patient outcomes [17]. Stress-induced changes in neurotransmitter systems, including serotonin and dopamine pathways, contribute to mood disturbances following surgery [18]. This explains why pharmacological and psychological interventions are often required simultaneously. Pain management remains a critical component of postoperative care. Multimodal analgesia not only improves physical comfort but also reduces emotional distress and prevents chronic pain syndromes [19]. Psychological interventions such as cognitive-behavioral therapy, relaxation techniques, and psychoeducation have demonstrated effectiveness in reducing anxiety and depression in postoperative patients. These approaches enhance coping strategies and improve emotional resilience [20].

## CONCLUSION

Postoperative anxiety and depression are common and clinically significant complications influenced by multiple risk factors, including preoperative psychological status, pain intensity, surgical severity, inflammatory responses, and social support. Effective management requires early identification, integrated medical and psychological care, and structured rehabilitation strategies. Addressing both biological and psychological components is essential for improving recovery trajectories, enhancing patient outcomes, and reducing long-term complications.

## REFERENCES

1. Mavros M.N., et al. Postoperative psychological outcomes. *Annals of Surgery*. 2021.
2. Kiecolt-Glaser J.K. Stress and wound healing. *Lancet*. 2021.
3. Desborough J.P. Stress response to trauma and surgery. *British Journal of Anaesthesia*. 2022.

4. McEwen B.S. Neurobiology of stress. Physiological Reviews. 2021.
5. Black N. Patient-reported outcome measures. BMJ. 2022.
6. Hinrichs-Rocker A., et al. Preoperative anxiety. European Journal of Anaesthesiology. 2021.
7. Chrousos G.P. Stress and HPA axis. Endocrine Reviews. 2021.
8. Kehlet H., Dahl J.B. Multimodal analgesia. Anesthesia & Analgesia. 2021.
9. Glaser R., Kiecolt-Glaser J.K. Stress and immunity. Nature Reviews Immunology. 2022.
10. Dantzer R., et al. Inflammation and depression. Nature Reviews Neuroscience. 2021.
11. Besedovsky L., et al. Sleep and immune function. Pflügers Archiv. 2022.
12. Uchino B.N. Social support and health. Psychological Bulletin. 2021.
13. Rosenberger P.H., et al. Psychological recovery after surgery. Health Psychology. 2022.
14. Carver C.S., Connor-Smith J. Coping mechanisms. Annual Review of Psychology. 2022.
15. Phillips-Bute B., et al. Long-term outcomes after surgery. Anesthesiology. 2021.
16. Mitchell M. Psychological preparation. Journal of Advanced Nursing. 2022.
17. Engel G.L. Biopsychosocial model. Science.
18. Krishnan V., Nestler E.J. Neurobiology of depression. Nature. 2021.
19. Apfelbaum J.L., et al. Postoperative pain guidelines. Journal of Pain. 2022.
20. Hofmann S.G., et al. CBT for anxiety and depression. Psychiatric Clinics. 2021.
21. Alimirzayev, N. (2025, February). EFFECTS OF POSITIVE AND NEGATIVE EMOTIONS ON HUMAN HEALTH. In Международная конференция академических наук (Vol. 4, No. 2, pp. 39-42).
22. Abdivaliyeva, A. N. (2022). Psychocorrection of behavioral and emotional fields in children with attention deficit and hyperactive. British Journal of Global Ecology and Sustainable Development, 10, 132-137.
23. Askarova N.A. (2025). Psixopatik xususiyatli onalar munosabatining bola psixik taraqqiyotiga ta'siri. Inter Education & Global Study, (4).
24. Abdivaliyeva, A. N. (2023). Factors of Psychosomatic Diseases in School Children. European Journal of Pedagogical Initiatives and Educational Practices, 1(1), 65-67.
25. Abdivaliyeva, A. N. (2022). Psychological factors influencing the formation of anorexia nervosa. British Journal of Global Ecology and Sustainable Development, 10, 152-155.
26. Factors of Psychosomatic Diseases in School Children. (2023). European Journal of Pedagogical Initiatives and Educational Practices, 1(1), 65-67.
27. Abdivaliyeva, A. N., & Jasurjon, R. (2025). O 'qituvchi pedagogik faoliyatida kasbiy refleksiya o'rni va tarbiya jarayonidagi mahorati.