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RESEARCH ARTICLE
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PREOPERATIVE ANXIETY AND ITS IMPACT ON POSTOPERATIVE PAIN AND RECOVERY IN ELECTIVE ABDOMINAL SURGERY.

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Abstract

Background: Preoperative anxiety is frequently observed among patients undergoing elective abdominal surgery and may adversely influence postoperative pain perception and recovery. Heightened anxiety triggers neuroendocrine stress responses that increase analgesic requirements, delay mobilization, and prolong hospital stay.

Objectives: To evaluate the association between preoperative anxiety and postoperative pain intensity, analgesic requirements, and early recovery outcomes in patients undergoing elective abdominal surgery.

Methodology: This prospective study included 100 adults scheduled for elective abdominal surgery over 6 months. Preoperative anxiety was assessed using the Hospital Anxiety and Depression Scale-Anxiety (HADS-A), and patients were categorized into low and high anxiety groups using a cutoff ≥8. Postoperative pain was measured using the Visual Analogue Scale (VAS) at 6, 12, and 24 hours. Opioid requirements, time to ambulation, and hospital stay were recorded. Data were analyzed using SPSS 24, with t-tests and chi-square applied; $p \leq 0.05$ was considered significant.

Results: The mean age of participants was 42.8 ± 12.6 years. Preoperative anxiety was identified in 46% of patients. Those with high anxiety reported significantly higher VAS pain scores at 6 hours (7.1 ± 1.4 vs. 5.6 ± 1.2; p=0.001), 12 hours (6.4 ± 1.3 vs. 4.8 ± 1.1; p=0.003), and 24 hours (5.3 ± 1.2 vs. 3.9 ± 1.0; p=0.005). Opioid consumption was also higher (p=0.02). Anxious patients experienced delayed ambulation (17.2 ± 3.8 vs. 13.9 ± 3.2 hours; p=0.01) and longer hospital stays (3.8 ± 1.1 vs. 2.9 ± 0.9 days; p=0.01).

Conclusion: Preoperative anxiety independently predicts higher postoperative pain and delayed recovery. Routine anxiety screening and preoperative counseling may improve postoperative outcomes and should be integrated into perioperative care.

Keywords: Preoperative anxiety; postoperative pain; abdominal surgery; recovery

Introduction:

Preoperative anxiety is a typical psychological response observed in patients preparing for elective surgical procedures, particularly abdominal surgeries, where fear of postoperative pain, anesthesia, complications, and the surgical environment can significantly heighten emotional distress [1]. Anxiety before surgery is not merely an emotional state; instead, it is a clinically relevant factor that may alter physiological responses and postoperative outcomes. The perioperative period triggers activation of the sympathetic nervous system, leading to elevations in cortisol, catecholamines, and inflammatory mediators. These neuroendocrine changes can intensify pain perception, increase analgesic requirements, and delay recovery [2]. For surgeons and anesthesiologists, understanding the burden of preoperative anxiety is essential because it directly influences postoperative morbidity, quality of recovery, hospitalization costs, and patient satisfaction [3].In elective abdominal surgeries—including cholecystectomy, hernia repair, appendectomy, and colorectal procedures—patients frequently experience heightened anxiety due to fear of surgical complications, postoperative wound pain, delayed bowel function, and prolonged recovery times. Literature suggests that patients with high preoperative anxiety tend to report higher pain scores at early postoperative intervals, slower mobilization, and increased opioid consumption. These outcomes may further elevate the risk of postoperative nausea, ileus, and respiratory suppression, thereby creating a negative cycle that slows overall rehabilitation. The relationship between anxiety and pain is well-established: emotional distress can lower pain thresholds, amplify pain interpretation, and interfere with coping mechanisms [4,5].Furthermore, high levels of anxiety before surgery may influence intraoperative hemodynamic stability, increasing blood pressure variability, anesthetic requirements, and postoperative emergence agitation [6]. This highlights anxiety as a modifiable risk factor with clinical significance across the surgical continuum. Although anxiety is widespread, it often remains underrecognized and undertreated in many surgical settings, particularly in low-resource environments where psychological screening tools are rarely integrated into preoperative evaluations [7]. To address this gap, validated instruments such as the Hospital Anxiety and Depression Scale (HADS-A) can be used to quantify preoperative anxiety and identify patients who may benefit from counseling or preoperative reassurance. Understanding how anxiety affects postoperative outcomes may support comprehensive perioperative protocols that include psychological optimization in addition to analgesia [8]. Enhanced Recovery After Surgery (ERAS) pathways emphasize multimodal analgesia, early mobilization, and patient education, yet the psychological component remains less explored [9]. Given the rising awareness of patient-centered surgical care, evaluation of preoperative anxiety and its relationship with postoperative recovery has become increasingly important. The present study aims to assess the impact of preoperative anxiety on postoperative pain intensity, analgesic requirements, early ambulation, and hospital stay among patients undergoing elective abdominal surgery [10]. Findings from this study may strengthen the evidence for incorporating anxiety screening and targeted interventions into routine surgical practice, ultimately improving outcomes and patient satisfaction.

Study Objectives:

To evaluate the impact of preoperative anxiety on postoperative pain severity, opioid requirements, early ambulation, and hospital stay among patients undergoing elective abdominal surgery using standardized assessment tools.

Materials and Methods:

Study Design & Setting:

This prospective study was conducted over six months at Surgery department of Islamic International Medical College, Rawalpindi from jan 2024 to june 2024.

Participants:

One hundred adult patients aged 18–65 years undergoing elective abdominal surgery were recruited through consecutive sampling. All participants were clinically stable and able to complete the anxiety

questionnaire independently. Patients were categorized into high and low anxiety groups using the HADS-A score. Written informed consent was obtained from all participants.

Sample Size Calculation:
Sample size was calculated using a 95% confidence interval, 80% power, and an expected medium effect size based on previous studies comparing anxiety levels with postoperative pain scores. A minimum of 92 participants was required; 100 patients were included to compensate for possible dropouts and ensure adequate analytical power.

Inclusion Criteria:
Adults aged 18–65 years, Elective abdominal surgery candidates, Ability to complete HADS-A, ASA class I–III

Exclusion Criteria:
Emergency surgeries, Chronic anxiety or psychiatric disorders, Chronic opioid use, Cognitive impairment preventing questionnaire completion

Diagnostic and Management Strategy:
Preoperative anxiety was assessed using the HADS-A. Postoperative pain was evaluated using the VAS at 6, 12, and 24 hours. All patients received standardized anesthesia and multimodal postoperative analgesia in accordance with institutional protocols.

Statistical Analysis:
Data were analyzed using SPSS version 24. Continuous variables were expressed as mean ± SD, and categorical variables as frequencies and percentages. Independent t-tests compared pain scores and recovery parameters between anxiety groups. Pearson correlation assessed associations. A p-value ≤ 0.05 was considered statistically significant.

Ethical Approval:
The Institutional Review Board approved this study of the participating tertiary-care hospital. All study procedures followed ethical guidelines for human study, and the protocol was reviewed to ensure patient rights, safety, confidentiality, and compliance with institutional and national study standards.

Results:
A total of 100 patients were included, with a mean age of 42.8 ± 12.6 years. Preoperative anxiety (HADS-A ≥8) was present in 46% of participants. Patients with high anxiety exhibited significantly higher postoperative pain scores at 6 hours (7.1 ± 1.4 vs. 5.6 ± 1.2; p=0.001), 12 hours (6.4 ± 1.3 vs. 4.8 ± 1.1; p=0.003), and 24 hours (5.3 ± 1.2 vs. 3.9 ± 1.0; p=0.005). Opioid consumption was greater among anxious patients (p=0.02). Early ambulation was significantly delayed (17.2 ± 3.8 vs. 13.9 ± 3.2 hours; p=0.01), and hospital stay was prolonged (3.8 ± 1.1 vs. 2.9 ± 0.9 days; p=0.01). A strong positive correlation was observed between anxiety scores and postoperative pain (r=0.54; p<0.001), as well as opioid use (r=0.42; p<0.01). No significant relationship was observed between anxiety and surgical type or operative duration. These findings demonstrate that preoperative anxiety independently predicts higher pain levels, increased analgesic needs, and slower recovery.

Intervention Outcome:
Patients with lower preoperative anxiety exhibited faster recovery, reduced opioid consumption, and lower pain scores across all postoperative intervals. High-anxiety patients showed delayed mobilization and prolonged hospitalization. Early identification and targeted anxiety-reducing interventions may enhance overall postoperative recovery and patient satisfaction.

Table 1. Baseline Demographic and Clinical Characteristics of Participants (n = 100)

Variable	Low Anxiety (n=54)	High Anxiety (n=46)	p-value
Mean Age (years)	41.6 ± 11.9	44.3 ± 13.4	0.28
Gender (Male/Female)	29/25	21/25	0.41
BMI (kg/m²), mean ± SD	25.7 ± 3.6	26.1 ± 3.9	0.52
ASA Class I/II/III	18/27/9	11/24/11	0.38
Type of Surgery (Open/Laparoscopic)	22/32	20/26	0.77

Table 1 presents the demographic and baseline clinical characteristics of participants, stratified by preoperative anxiety levels. No significant differences were observed between groups, indicating comparability of baseline variables.

Table 2. Comparison of Postoperative Pain Scores Between Anxiety Groups

Time Interval	Low Anxiety (Mean ± SD)	High Anxiety (Mean ± SD)	p-value
VAS at 6 hours	5.6 ± 1.2	7.1 ± 1.4	0.001
VAS at 12 hours	4.8 ± 1.1	6.4 ± 1.3	0.003
VAS at 24 hours	3.9 ± 1.0	5.3 ± 1.2	0.005
Total Opioid Use (mg morphine equivalent)	11.8 ± 3.2	15.7 ± 4.1	0.02

Table 2 compares postoperative pain scores and opioid requirements between anxiety groups. High-anxiety patients demonstrated significantly higher pain scores across all time points and required greater opioid analgesia.

Table 3. Postoperative Recovery Outcomes in Low vs. High Anxiety Groups

Outcome	Low Anxiety	High Anxiety	p-value
Time to Ambulation (hours)	13.9 ± 3.2	17.2 ± 3.8	0.01
Hospital Stay (days)	2.9 ± 0.9	3.8 ± 1.1	0.01
Postoperative Nausea (%)	22%	39%	0.08
Requirement for Rescue Analgesia (%)	31%	57%	0.02

Table 3 outlines key recovery parameters. Patients with high preoperative anxiety experienced delayed mobilization, longer hospitalization, and higher rescue analgesia needs.

Table 4. Correlation Between Preoperative Anxiety Scores and Postoperative Outcomes

Variable	Correlation Coefficient (r)	p-value
VAS Pain Score (6–24 hours)	0.54	<0.001
Opioid Use	0.42	<0.01
Time to Ambulation	0.36	0.02
Length of Hospital Stay	0.33	0.03

Table 4 presents Pearson's correlation analysis. Higher preoperative anxiety scores showed a significant positive correlation with postoperative pain, opioid use, delayed ambulation, and prolonged hospital stay.

Discussion:

The present study demonstrates a significant association between preoperative anxiety and adverse postoperative outcomes among patients undergoing elective abdominal surgery. Patients with elevated HADS-A scores experienced higher postoperative pain intensity, increased opioid requirements, delayed ambulation, and more extended hospital stays [11]. These findings reinforce

the concept that psychological status before surgery is an independent and clinically relevant predictor of postoperative recovery [12]. In recent years, growing evidence has emphasized the physiological pathways linking anxiety to pain modulation. Heightened anxiety stimulates sympathetic activation, increases cortisol secretion, and lowers pain thresholds, resulting in greater nociceptive sensitivity during the postoperative period [13]. Our results support this biological interaction, with anxious patients reporting significantly higher VAS scores at 6, 12, and 24 hours postoperatively [14]. A prospective study by Wang et al. (2021) similarly found that high preoperative anxiety predicted 35–40% higher postoperative pain scores within the first 24 hours after abdominal surgery [15]. Our findings also align with those of Gökçe et al. (2020), who reported that patients with elevated anxiety required substantially higher postoperative opioid doses compared with those with minimal anxiety. The increased opioid consumption documented in our cohort further confirms this pattern. Anxious individuals may have enhanced vigilance toward pain, exaggerated catastrophizing responses, and impaired coping mechanisms, all of which may heighten analgesic needs [16]. Delayed ambulation among high-anxiety patients observed in our study is consistent with the recent work of Martin et al. (2022), who identified preoperative anxiety as a barrier to early mobilization in Enhanced Recovery After Surgery pathways [17]. Their findings suggest that anxiety impairs patient motivation, energy levels, and psychological readiness for early activity. Similarly, a multicenter study in 2023 found that anxious surgical patients had 20–30% longer ambulation times due to elevated fear of pain and postoperative complications [18]. The prolonged hospital stay in our anxiety group parallels reports by Lerman et al. (2020), who demonstrated that preoperative anxiety increased length of stay by an average of 1.2–1.5 days in general surgery patients [19]. Our results fall within this range, further suggesting that anxiety may slow multiple dimensions of recovery, including bowel function, wound comfort, and mobilization. Correlation analysis in our study shows a strong relationship between anxiety and postoperative pain ($r=0.54$), consistent with meta-analyses published between 2019 and 2022 that identified moderate-to-strong correlations between anxiety and pain scores across surgical populations [20]. These associations reinforce the concept of anxiety as a modifiable risk factor and highlight the need for systematic preoperative screening. Several studies have investigated interventions to reduce preoperative anxiety, such as structured counseling, audiovisual education, relaxation therapy, and smartphone-based psychological programs [21]. A randomized trial by Ahmed et al. (2022) found that preoperative counseling reduced postoperative pain scores and opioid use by over 25% in laparoscopic surgery patients [22]. While our study did not include an interventional arm, the outcome trends suggest that implementing such strategies could meaningfully improve recovery trajectories. Despite the consistency of our findings with recent literature, some variability exists regarding anxiety prevalence across studies. We found a prevalence of 46%, similar to the 40–55% range reported in recent Asian studies [23], but slightly higher than the 25–35% reported in European cohorts [24]. Differences in cultural attitudes, health literacy, and preoperative preparation protocols likely contribute to these disparities. Overall, this study reinforces the growing recognition of preoperative anxiety as a critical determinant of postoperative pain and recovery [25]. Integrating psychological assessment and targeted anxiety-reduction strategies into routine surgical care may help optimize outcomes, reduce opioid dependency, and enhance patient satisfaction in abdominal surgery patients.

Limitations:

This study was limited by its single-center design and relatively small sample size, which may affect generalizability. Anxiety was assessed only once preoperatively, without long-term follow-up. Potential confounders such as personality traits, socioeconomic factors, and variations in pain tolerance could not be fully controlled.

Conclusion:

Preoperative anxiety significantly increases postoperative pain, opioid requirements, and delays recovery in elective abdominal surgery patients. Routine anxiety screening and targeted preoperative counseling may improve postoperative outcomes. Integrating psychological assessment into

perioperative care pathways can enhance recovery quality, reduce complications, and support more patient-centered surgical management.

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Authors Contributions

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