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Original Research Article

Characterization of Preoperative Anxiety and Its Influence on Postoperative Pain Scores in Adult Patients Undergoing Elective Surgical Procedures in a Tertiary Care Hospital

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Abstract: *Preoperative anxiety is a common psychological response among patients undergoing elective surgery and has been increasingly recognized as an important determinant of postoperative outcomes, particularly pain. Elevated anxiety levels prior to surgery may amplify pain perception and adversely affect recovery, yet data from low- and middle-income countries remain limited.* ***Objective:*** *To determine the prevalence of preoperative anxiety and evaluate its association with postoperative pain among adult patients undergoing elective surgical procedures at a tertiary care hospital in Pakistan.* ***Methods:*** *A descriptive case series was conducted at Doctors Hospital and Medical Center in Lahore from January to April 2025. A total of 100 adult patients aged 18–60 years scheduled for elective surgery under general anesthesia were enrolled using non-probability consecutive sampling. Preoperative anxiety was assessed using the State Anxiety Inventory Form Y-6, with scores >40 indicating clinically significant anxiety. Postoperative pain was measured using the Numeric Rating Scale at one and three hours after surgery. Associations were analyzed using chi-square testing, correlation measures, and binary logistic regression.* ***Results:*** *The mean age of participants was 39.8 ± 11.2 years, and 54% were female. Preoperative anxiety was present in 38% of patients. Postoperative pain was reported by 76.3% of anxious patients compared to 16.1% of non-anxious patients ($\chi^2 = 35.874$, $p < 0.001$). A strong positive correlation was observed between preoperative anxiety and postoperative pain (Phi and Cramer's V = 0.599). Logistic regression demonstrated that preoperative anxiety was an independent predictor of postoperative pain, increasing the odds by approximately sixteen times (OR = 16.19, 95% CI: 5.56–47.15). Gender, body mass index, and marital status were not significant predictors.* ***Conclusion:*** *Preoperative anxiety is highly prevalent and strongly associated with postoperative pain among elective surgical patients Early identification and targeted management of anxiety may play a critical role in improving postoperative pain outcomes and overall recovery.*

Keywords: Preoperative anxiety, postoperative pain, elective surgery, anxiety assessment

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Introduction

Preoperative anxiety is a prevalent psychological condition experienced by many patients undergoing elective surgical procedures. It is characterized by feelings of unease, apprehension, or fear regarding the surgical process, which may include worries about pain, potential complications, and postoperative recovery (1,2). High levels of preoperative anxiety have been associated with several adverse outcomes, including increased postoperative pain, prolonged recovery times, and higher rates of complications such as postoperative delirium in certain populations (3–5). Research indicates that approximately 25% to 80% of patients report feelings of anxiety prior to surgery, highlighting the widespread nature of this issue (6,7).

Several studies have established a direct correlation between preoperative anxiety levels and postoperative pain scores. For instance, Gao et al. reported that patients classified in the high anxiety group had a significantly greater incidence of severe postoperative pain, with rates of 30.6% compared to only 9% in the low anxiety group (1). Similarly, Parveen et al. observed that a substantial proportion of surgical patients experienced considerable anxiety, which subsequently influenced their postoperative pain perception (3). These findings are consistent with those of Kashif et al., who emphasized that heightened preoperative anxiety is strongly associated with increased postoperative pain and a greater requirement for analgesics (7). Furthermore, evidence suggests that anxiety adversely affects physiological responses, thereby amplifying pain perception and prolonging recovery time (4,5).

Multiple factors influence the prevalence and severity of preoperative anxiety, including patient demographics, previous surgical experiences, and the type of surgical procedure performed (8–10). Gender-based differences have been consistently reported, with female patients demonstrating higher anxiety levels than male patients (11,12). Psychological factors such as fear of surgical complications and postoperative pain remain key predictors of preoperative anxiety (5,13).

Within the context of the Pakistani healthcare system, it is essential to examine these parameters. A study by Farooqui et al. reported a high prevalence of preoperative anxiety among adult surgical patients in Karachi, with rates comparable to international data (9). In Pakistan, cultural perceptions surrounding surgery and healthcare may further exacerbate anxiety among patients. Therefore, understanding the characteristics of preoperative anxiety and its association with postoperative outcomes is critical for improving patient-centered care. This study aims to assess preoperative anxiety and its impact on postoperative pain scores among adult patients undergoing elective surgery at a tertiary care hospital, thereby contributing evidence relevant to clinical practice in Pakistan.

Methodology

This descriptive case series was conducted at the preoperative assessment area and the Post Anesthesia Care Unit of Doctors Hospital and Medical Center, Lahore, Pakistan, over a period of three months from 2 January 2025 to 3 April 2025. The study included adult patients scheduled for

elective surgical procedures under general anesthesia. A total of 100 patients aged between 18 and 60 years were enrolled using a non-probability consecutive sampling technique.

Patients of either gender who consented to participate were included in the study. Patients with previously diagnosed neurological or psychiatric disorders, those undergoing emergency surgical procedures, and individuals who declined consent were excluded to avoid potential confounding effects on anxiety levels and pain perception. Ethical approval for the study was obtained from the Institutional Ethical Committee of Doctors Hospital and Medical Center, and the CPSP Research Evaluation Unit approved the study synopsis. Written informed consent was obtained from all participants prior to enrollment, and confidentiality was maintained by assigning each participant a unique identification number.

All patients underwent a standardized pre-anesthesia assessment. Preoperative anxiety was assessed using the State Anxiety Inventory Form Y 6, which measures situational anxiety by evaluating how the patient feels at the time of the evaluation. The questionnaire consists of six statements and was administered by the primary investigator, with responses recorded on a pre-designed proforma. A total score greater than 40 was considered indicative of clinically significant preoperative anxiety, while scores of 40 or less were categorized as no or minimal anxiety.

All surgical procedures were performed under general anesthesia using a standardized anesthetic technique. Intraoperative analgesia consisted of 1 gram of paracetamol, 30 milligrams of ketorolac, and 50 milligrams of tramadol administered to all patients. Postoperatively, patients received 50 milligrams of tramadol as rescue analgesia when required in the Post-Anesthesia Care Unit.

Prior to surgery, all patients were instructed to use the Numeric Rating Scale to assess pain. Postoperative pain intensity was assessed using the Numeric Rating Scale at one hour and three hours following surgery. Pain scores were recorded by trained healthcare staff and documented in the study proforma.

Demographic data, including age, gender, body mass index, and marital status, were collected for all participants. Clinical variables included preoperative anxiety status and the presence of postoperative pain. All data were entered into SPSS software version 25 for analysis. Continuous variables were summarized as mean and standard deviation, while categorical variables were expressed as frequencies and percentages. The association between preoperative anxiety and postoperative pain was evaluated using the chi-square test. Correlation analysis was performed to assess the strength of association between anxiety and pain scores. Binary logistic regression analysis was conducted to identify independent predictors of postoperative pain, with results reported as odds ratios and 95 percent confidence intervals. A p-value of 0.05 or less was considered statistically significant.

Results

A total of 100 participants were included in the study. The mean age of the study participants was 39.8 ± 11.2 years, with an age range of 18 to 60 years. Slightly more than half of the participants were female (54.0%), while males constituted 46.0% of the sample. The mean body mass index of the participants was 26.4 ± 3.8 kg/m². Regarding marital status, 58.0% of the participants were married, whereas 42.0% were unmarried (Table 1).

Preoperative anxiety was present in 38.0% of the participants, while the majority (62.0%) did not exhibit preoperative anxiety (Table 2).

A significant association was observed between preoperative anxiety and postoperative pain. Among participants with preoperative anxiety, 76.3% experienced postoperative pain, compared to only 16.1% among those without preoperative anxiety. Conversely, postoperative pain was absent in 83.9% of participants without preoperative anxiety, whereas only 23.7% of anxious participants reported no postoperative pain. The chi-square test demonstrated a statistically significant association between preoperative anxiety and postoperative pain ($\chi^2 = 35.874$, df = 1, $p < 0.001$). Measures of association indicated a strong relationship, with Phi, Cramer's V, Pearson correlation coefficient, and Spearman's rho all equal to 0.599, reflecting a strong positive correlation between preoperative anxiety and postoperative pain (Table 3). Logistic regression analysis was performed to identify predictors of postoperative pain. Preoperative anxiety emerged as a strong and independent predictor, significantly increasing the likelihood of postoperative pain (B = 2.784, $p < 0.001$). Patients with preoperative anxiety had approximately 16 times higher odds of experiencing postoperative pain compared to those without anxiety (OR = 16.19, 95% CI: 5.56–47.15). Gender, body mass index, and marital status were not statistically significant predictors of postoperative pain in the regression model ($p > 0.05$ for all). However, a trend toward increased odds with higher body mass index was observed (Table 4).

Table 1: Demographic Characteristics of Study Participants (n = 100)

Variable	Category	n (%) or Mean ± SD
Age (years)	Mean ± SD	39.8 ± 11.2
	Range	18–60
Gender	Male	46 (46.0)
	Female	54 (54.0)
Body Mass Index (kg/m²)	Mean ± SD	26.4 ± 3.8
Marital Status	Married	58 (58.0)
	Unmarried	42 (42.0)

Table 2: Distribution of Preoperative Anxiety Status Among Participants (n = 100)

Preoperative Anxiety Status	Frequency (n)	Percentage (%)
Present	38	38.0
Absent	62	62.0

Table 3: Association and Correlation Between Preoperative Anxiety and Postoperative Pain (n = 100)

Preoperative Anxiety	Postoperative Pain Present n (%)	Postoperative Pain Absent n (%)	Total
Present	29 (76.3)	9 (23.7)	38
Absent	10 (16.1)	52 (83.9)	62
Total	39	61	100
Chi square test: $\chi^2 = 35.874$, df = 1, $p < 0.001$			

Table 4: Logistic Regression Analysis for Predictors of Postoperative Pain

Variable	B	SE	Wald	df	p value	Odds Ratio (OR)	95% CI for OR
Preoperative anxiety	2.784	0.545	26.115	1	< 0.001	16.185	5.56–47.15
Gender	0.412	0.323	1.62	1	0.202	1.51	0.80–2.84
Body mass index	0.118	0.069	2.90	1	0.088	1.13	0.99–1.29
Marital status	0.287	0.257	1.26	1	0.262	1.33	0.80–2.21

Discussion

The significance of understanding the relationship between preoperative anxiety and postoperative pain is underscored by the findings of the present study, which included 100 participants with a mean age of 39.8 ± 11.2 years. Preoperative anxiety was identified in 38% of the study population. These findings are consistent with existing literature indicating that preoperative anxiety is a common phenomenon among surgical patients, with reported prevalence ranging from 24% to 60% in comparable observational studies (14–16).

In the present study, more than half of the participants (54%) were female, and the mean body mass index (BMI) was 26.4 ± 3.8 kg/m². These demographic characteristics are comparable to those reported in previous studies, including that by Qaddumi et al., who documented a higher prevalence of anxiety among female surgical patients (15). Additionally, although the prevalence of anxiety observed in this study aligns closely with existing evidence, the relatively elevated mean BMI may suggest a possible association between obesity and anxiety. This association has also been reported in earlier research (16,17).

A key finding of this study was the strong association between preoperative anxiety and postoperative pain. Among participants with preoperative anxiety, 76.3% reported postoperative pain, compared to only 16.1% among those without anxiety. This substantial difference is in agreement with findings reported by Eberhart et al. and Zhu et al., who demonstrated that elevated preoperative anxiety levels significantly predict both the incidence and severity of postoperative pain (18,19). The chi-square analysis in the present study further confirmed this relationship ($\chi^2 = 35.874$, $p < 0.001$), with measures of association indicating a strong positive correlation (Phi and Cramer's V = 0.599). These results are consistent with the observations of Keltz et al., who similarly highlighted the predictive role of preoperative anxiety on postoperative pain outcomes (20).

Logistic regression analysis revealed that preoperative anxiety was a strong independent predictor of postoperative pain. Patients with preoperative anxiety had nearly 16-fold higher odds of experiencing postoperative pain (OR = 16.19, 95% CI: 5.56–47.15). This magnitude of association is comparable to that reported by Kashif et al., further reinforcing the critical role of psychological factors in influencing surgical recovery and pain perception (21,22). In contrast, variables such as gender, BMI, and marital status did not show statistically significant associations with postoperative pain in the regression model. This finding differs from some previous studies that have reported these variables as potential predictors (16,23), suggesting that contextual or population-specific factors may influence these relationships and warrant further investigation.

The relevance of preoperative anxiety and its association with postoperative pain is particularly pronounced within the Pakistani healthcare context, where cultural perceptions of surgery and limited health literacy may intensify anxiety prior to surgical procedures. Previous regional studies have demonstrated that patients often have significant concerns about surgical outcomes, complications, and recovery (9–11). The relatively high prevalence of anxiety observed in the present study underscores the need for structured preoperative counseling and targeted psychological interventions to reduce anxiety and improve postoperative outcomes. Moreover, limited access to mental health resources in Pakistan may further exacerbate preoperative psychological distress, highlighting an important area for healthcare system improvement (11,12).

Thus, the findings of this study strongly support existing evidence regarding the impact of preoperative anxiety on postoperative pain and emphasize the importance of culturally sensitive, patient-centered strategies to address anxiety in surgical populations in Pakistan. Future research should focus on developing and evaluating effective preoperative psychological interventions to enhance postoperative recovery and overall surgical outcomes.

Conclusion

This study demonstrates that preoperative anxiety is a common and clinically significant problem among adult patients undergoing elective surgery and is a strong independent predictor of postoperative pain. Patients with elevated anxiety levels were substantially more likely to experience postoperative pain, irrespective of demographic factors such as gender, body mass index, or marital status. These findings highlight the importance of integrating routine preoperative anxiety assessment into surgical care pathways. Implementing structured counseling and psychological support strategies tailored to the local healthcare context may help reduce anxiety-related pain burden and improve postoperative recovery outcomes in Pakistani surgical populations.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-24)

Consent for publication
Approved

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Conflict of interest

The authors declared no conflict of interest.

Author Contribution

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Conception of study,Study design, development of Research methodology design, Data analysis, manuscript drafting
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Data analysis, manuscript review, critical input
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Data collection, Review of Literature, Data entry, and drafting an article.
MI (Supervisor)
Final approval and review of the paper critically

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

References

1. Gao P., Zhang Y., Sun J., Deng C., & Zhang W. The correlation between preoperative anxiety and postoperative pain in patients

undergoing laparoscopic cholecystectomy. 2024. https://doi.org/10.21203/rs.3.rs-4491949/v1
2. Tomaszek L. and Ozga D. Predictors of maximal postoperative pain at rest in adult patients undergoing elective surgery – A multicenter observational study. Nursing and Health Sciences 2021;23(3):754-762. https://doi.org/10.1111/nhs.12853
3. Parveen S., Khan N., Waseem H., Bakhsh M., & Aziz A. Frequency Of Anxiety in Pre-Operative Surgical Patients in the Tertiary Care Hospitals, Karachi. JHRR 2024;4(1):1587-1596. https://doi.org/10.61919/jhrr.v4i1.639
4. Gu X., Zhang Y., Wei W., & Zhu J. Effects of Preoperative Anxiety on Postoperative Outcomes and Sleep Quality in Patients Undergoing Laparoscopic Gynecological Surgery. Journal of Clinical Medicine 2023;12(5):1835. https://doi.org/10.3390/jcm12051835
5. Aykut A., Salman N., Demir A., Eser A., Özgök A., & Günaydın S.. The Influence of Pre-operative Pain and Anxiety on Acute Postoperative Pain in Cardiac Surgery Patients Undergoing Enhanced Recovery after Surgery. Turkish Journal of Anaesthesiology and Reanimation 2023;51(6):491-495. https://doi.org/10.4274/tjar.2023.231477
6. Berhe Y., Belayneh T., Lema G., Getnet M., & Chekol W. The overlooked problem among surgical patients: Preoperative anxiety at Ethiopian University Hospital. Frontiers in Medicine 2022;9. https://doi.org/10.3389/fmed.2022.912743
7. Kashif M., Hamid M., & Raza A. Influence of Preoperative Anxiety Level on Postoperative Pain After Cardiac Surgery. Cureus 2022. https://doi.org/10.7759/cureus.22170
8. Jiwanmall M., Jiwanmall S., Williams A., Kamakshi S., Sugirtharaj L., Poornima K., et al.. Preoperative Anxiety in Adult Patients Undergoing Day Care Surgery: Prevalence and Associated Factors. Indian Journal of Psychological Medicine, 2020; 42(1):87-92. https://doi.org/10.4103/ijpsym.ijpsym_180_19
9. Farooqui A., Jamil O., Muhib M., Shahid A., Maqsood A., Lari A.et al.. Psychometric evaluation of Urdu-translated Amsterdam preoperative anxiety and information scale and assessment of preoperative anxiety in adult surgical patients of Karachi, Pakistan: A cross-sectional study. Sage Open Medicine 2023;11. https://doi.org/10.1177/20503121231208264
10. Acharya S., Gurung R., & Parajuli B. Preoperative Anxiety Assessment in Adult Patients Undergoing Elective Surgeries: A Cross-Sectional Observational Study. Journal of the Institute of Medicine Nepal 2020;42(3):18-22. https://doi.org/10.59779/jiomnepal.1126
11. Wang Y., Wang Y., Zhang X., Zhang X., Chen X., Gao R.et al.. Effects of estazolam, remimazolam, and their combination on preoperative anxiety and postoperative pain after gynecological laparoscopic surgery: a double-blind, randomized, controlled trial. 2023. https://doi.org/10.21203/rs.3.rs-3141827/v1
12. Ben-Arye E., Segev Y., Galil G., Marom I., Gressel O., Stein N.et al.. Acupuncture during gynecological oncology surgery: A randomized controlled trial assessing the impact of integrative therapies on perioperative pain and anxiety. Cancer 2023;129(6):908-919. https://doi.org/10.1002/cncr.34542
13. Biawan H. and Suroso J. A correlation between spiritual level and preoperative patients' anxiety. Proceedings Series on Health & Medical Sciences 2020;1:54-59. https://doi.org/10.30595/pshms.v1i.33
14. Nguyen S., Hassett A., Hu H., Brummett C., Bicket M., Carlozzi N.et al.. Prospective cohort study on the trajectory and association of perioperative anxiety and postoperative opioid-related outcomes. Regional Anesthesia & Pain Medicine 2022;47(10):637-642. https://doi.org/10.1136/rapm-2022-103742
15. Qaddumi J., Arda A., Alkhawaldeh A., ALBashtawy M., Abdalrahim A., ALBashtawy S.et al.. Preoperative anxiety, postoperative pain tolerance, and analgesia consumption: A prospective cohort study. Journal of Perioperative Practice 2024;35(10):426-436. https://doi.org/10.1177/17504589241253489
16. Aykut A., Salman N., Demir A., Eser A., Özgök A., & Günaydın S.. The Influence of Pre-operative Pain and Anxiety on Acute Postoperative Pain in Cardiac Surgery Patients Undergoing Enhanced Recovery after Surgery. Turkish Journal of Anaesthesiology and Reanimation 2023;51(6):491-495. https://doi.org/10.4274/tjar.2023.231477
17. Wang Y., Wang Y., Zhang X., Zhang X., Chen X., Gao R.et al.. Effects of estazolam, remimazolam, and their combination on preoperative anxiety and postoperative pain after gynecological laparoscopic surgery: a double-blind, randomized, controlled trial. 2023. https://doi.org/10.21203/rs.3.rs-3141827/v1
18. Eberhart L., Aust H., Schuster M., Sturm T., Gehling M., Euteneuer F., et al. Preoperative anxiety in adults - a cross-sectional study on specific fears and risk factors. BMC Psychiatry 2020;20(1). https://doi.org/10.1186/s12888-020-02552-w
19. Zhu Q., Qu L., Su T., Zhao X., Ma X., Chen Z., et al. Risk Factors of Acute Pain in Elderly Patients After Laparoscopic Radical Resection of Colorectal Cancer. Surgical Laparoscopy Endoscopy & Percutaneous Techniques 2023;34(1):43-47. https://doi.org/10.1097/sle.0000000000001254
20. Keltz A., Heesen P., Katz D., Neuman I., Morgenshtein A., Azem K., et al Intraoperative pain during caesarean delivery: Incidence, risk factors and physician perception. European Journal of Pain 2021;26(1):219-226. https://doi.org/10.1002/ejp.1856
21. Kashif M., Hamid M., & Raza A. Influence of Preoperative Anxiety Level on Postoperative Pain After Cardiac Surgery. Cureus 2022. https://doi.org/10.7759/cureus.22170
22. Sulen N.. Effects of Preoperative Anxiety, Depression, and Pain on Quality of Postoperative Recovery and Acute Postoperative Pain after Radical Prostatectomy: a Prospective Observational Study. Acta Clinica Croatica 2023. https://doi.org/10.20471/acc.2023.62.04.14
23. Wang S., Cardieri B., Lin H., Liu X., Sano M., & Deiner S. Depression and anxiety symptoms are related to pain and frailty but not cognition or delirium in older surgical patients. Brain and Behavior 2021;11(6). https://doi.org/10.1002/brb3.2164