

ASSOCIATION OF PREOPERATIVE ANXIETY AND DEPRESSION WITH POSTOPERATIVE PAIN AT BACHA KHAN MEDICAL COMPLEX

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DOI: <https://doi.org/10.5281/zenodo.21423013>

Keywords

anxiety; depression; postoperative pain; DASS; Visual Analogue Scale; elective surgery

Article History

Received: 15 May 2026

Accepted: 23 June 2026

Published: 29 June 2026

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Abstract

Background: Preoperative psychological distress may alter pain perception and recovery after surgery. This study evaluated the relationship of anxiety and depressive symptoms before surgery with postoperative pain among patients treated at Bacha Khan Medical Complex.

Methods: An analytical cross-sectional study was conducted among 120 adults aged 18-65 years who underwent elective procedures under general or regional anesthesia. Anxiety and depression were assessed preoperatively with DASS-based subscales, and pain was recorded after surgery on a 0-10 Visual Analogue Scale. Data were summarized as frequencies, percentages and cumulative percentages.

Results: Extremely severe anxiety was the most frequent anxiety category (46/120; 38.3%), whereas moderate depression was the most frequent depression category in the source table (54 participants; 45.0%). A VAS score of 10 was recorded in 31 patients (25.8%), and the pain-severity table classified 40 patients (33.3%) as having worst pain. The descriptive pattern indicated greater postoperative pain among patients with higher preoperative anxiety. Moderate-to-severe depressive symptoms also occurred in patients reporting higher pain, although the relationship was less consistent.

Conclusion: Preoperative anxiety appeared to be more consistently related to postoperative pain than depression. Screening and targeted psychological support before surgery may strengthen perioperative pain management. Because the available analysis was descriptive and cross-sectional, confirmatory studies with inferential testing are required.

1. INTRODUCTION

Surgery is both a physical intervention and a psychologically demanding event. Uncertainty about anesthesia, possible complications, postoperative disability and anticipated pain may produce marked anxiety in the hours or days before an operation. Although a modest degree of concern is expected, persistent or severe distress can influence physiological arousal, coping behaviour and recovery after anesthesia [1,2,9-11]. Postoperative pain remains common despite improvements in anesthesia and multimodal analgesia. Its intensity is shaped not only by tissue injury and the type of procedure, but also by previous pain, expectations, demographic characteristics and emotional state [3,12-14]. Poorly controlled pain may limit breathing and mobilization, delay discharge, increase analgesic use and contribute to prolonged or chronic postsurgical pain [3,12,13].

Anxiety may heighten vigilance to bodily sensations and lower the threshold at which nociceptive input is experienced as threatening. Studies in abdominal, gynecological, neurosurgical, orthopedic and ear-nose-throat populations have frequently reported higher pain or greater analgesic requirements among patients with elevated preoperative anxiety [4-7,10,16,19]. Nevertheless, the strength of this relationship varies across procedures, measurement instruments and assessment times.

Depression may also influence postoperative pain through reduced motivation, negative expectations, altered sleep, fatigue and limited engagement in rehabilitation. Evidence is less uniform than for anxiety: some studies associate depressive symptoms with greater pain and less favourable recovery, whereas others find a weaker or time-dependent effect [3,8,15,17,18,20,21]. This inconsistency supports further investigation in local surgical populations.

Bacha Khan Medical Complex manages patients undergoing a broad range of elective procedures, yet local evidence on the psychological contributors to postoperative pain is limited. Identifying patients at increased risk before surgery could support counselling, expectation setting and individualized analgesic planning. The

present study therefore examined the relationship of preoperative anxiety and depression with postoperative pain among adult surgical patients at this institution.

2. METHODOLOGY

2.1 Study design and setting

An analytical cross-sectional study was carried out at Bacha Khan Medical Complex, Swabi. The research project was described as lasting six months, while participant recruitment and data collection occurred from October 2024 to January 2025. The design was used to examine associations between preoperative psychological symptoms and postoperative pain; it does not establish causality.

2.2 Participants and sampling

Eligible participants were recruited consecutively as they presented for elective surgery. The source protocol reported an EPI Info Version 3 sample-size estimate of 328 at a 95% confidence level; however, the completed and analyzed dataset contained 120 participants. All results in this manuscript are based on those 120 patients.

2.3 Eligibility criteria

- **Inclusion criteria:** age 18-65 years; elective surgery; American Society of Anesthesiologists class I or II; ability to understand and complete the questionnaire; capacity to provide written informed consent; and no serious cognitive impairment that would interfere with participation.

- **Exclusion criteria:** disability or cognitive impairment that could compromise participation or recovery; inability to cooperate during postoperative assessment; major psychiatric illness, including major depression, anxiety disorder or schizophrenia; inability to complete the questionnaire because of language, literacy or intellectual limitations; Parkinson disease or a similar cognitive disorder; and pre-existing drug use considered likely to modify anesthetic response or postoperative recovery.

2.4 Measures and data collection

After the study was explained in the participant's preferred language, written informed consent was obtained. Preoperative anxiety and depressive symptoms were assessed using the anxiety and depression components of the DASS instrument

as described in the source manuscript. Individual items were scored from 0 to 3, component totals were multiplied by two, and the resulting scores were classified into severity categories. Postoperative pain was measured with a Visual Analogue Scale ranging from 0 (no pain) to 10 (worst pain).

2.5 Statistical analysis

The available dataset was summarized using frequencies, percentages and cumulative percentages. Percent and Valid Percent were identical in the original SPSS output; therefore, only one percentage column is presented. No

correlation coefficient, regression model, confidence interval or p value was available in the source manuscript. Accordingly, statements about relationships are interpreted as descriptive rather than confirmatory.

2.6 Ethical considerations

Participation was voluntary, and written informed consent was obtained after the study procedures had been explained in the participant's native language. The source manuscript states that the study followed the principles of the Declaration of Helsinki.

3. Results

3.1 Participant characteristics

The study included 120 adults. The largest age group was 26-35 years (28.3%), followed by 36-45 years (26.7%). Women represented 56.7% of the sample. Major abdominal operations were the

most frequent procedures (21.7%), followed by orthopedic (17.5%) and gynecological surgery (15.0%). Most participants had no previous surgical history (62.5%), and high-school education was the most common educational level (36.7%).

Table 1. Demographic and clinical characteristics of the study participants (n=120)

Variable	Category	n	%	Cumulative %
Age	18-25	20	16.7	16.7
Age	26-35	34	28.3	45.0
Age	36-45	32	26.7	71.7
Age	46-55	26	21.7	93.3
Age	56+	8	6.7	100.0
Gender	Female	68	56.7	56.7
Gender	Male	52	43.3	100.0
Surgery	DNS	2	1.7	1.7
Surgery	Fistula	10	8.3	10.0
Surgery	Gynecological	18	15.0	25.0
Surgery	Hemorrhoids	6	5.0	30.0
Surgery	Hernia	3	2.5	32.5
Surgery	Lipoma	5	4.2	36.7
Surgery	Major abdominal	26	21.7	58.3
Surgery	Orthopedic	21	17.5	75.8
Surgery	Polyps	3	2.5	78.3
Surgery	Septoplasty	2	1.7	80.0

Variable	Category	n	%	Cumulative %
Surgery	TAH	4	3.3	83.3
Surgery	Tonsillectomy	16	13.3	96.7
Surgery	Tungs procedure	4	3.3	100.0
Previous surgery	1-2	41	34.2	34.2
Previous surgery	3+	4	3.3	37.5
Previous surgery	None	75	62.5	100.0
Education	High school	44	36.7	36.7
Education	No education	35	29.2	65.8
Education	Primary school	28	23.3	89.2
Education	Undergraduate	13	10.8	100.0

3.2 Anxiety findings

Nervousness or anxiety was reported at some level by 90.8% of participants. Apprehension about pain or outcome was present in 82.5%, heart racing in 80.8% and panic symptoms in 79.2%.

Extremely severe anxiety was the largest severity category (38.3%), followed by moderate (21.7%) and severe anxiety (20.8%).

Table 2. Distribution of responses to anxiety-related items

Item	Score 0, n (%)	Score 1, n (%)	Score 2, n (%)	Score 3, n (%)
Dry mouth	32 (26.7%)	23 (19.2%)	30 (25.0%)	35 (29.2%)
Trouble breathing	71 (59.2%)	32 (26.7%)	17 (14.2%)	0 (0.0%)
Trembling in body	34 (28.3%)	39 (32.5%)	39 (32.5%)	8 (6.7%)
Apprehensive about pain/outcome	21 (17.5%)	40 (33.3%)	50 (41.7%)	9 (7.5%)
Panic attack	25 (20.8%)	47 (39.2%)	34 (28.3%)	14 (11.7%)
Heart racing/beating faster	23 (19.2%)	52 (43.3%)	34 (28.3%)	11 (9.2%)
Nervous/anxious	11 (9.2%)	42 (35.0%)	55 (45.8%)	12 (10.0%)

Table 3. Anxiety severity categories

Category	n	%	Cumulative %
Extremely severe	46	38.3	38.3
Mild	10	8.3	46.7
Moderate	26	21.7	68.3
Normal	13	10.8	79.2
Severe	25	20.8	100.0

The most frequent multiplied anxiety-sum category was 7×2 (17 participants; 14.2%). In the

final anxiety-score distribution, score 14 was most common (15 participants; 12.5%), followed by scores 16 (14; 11.7%) and 18 (11; 9.2%). Complete score distributions are presented in Supplementary Table S1.

3.3 Depression findings

Difficulty focusing and loss of interest were prominent depressive features. Moderate or severe disinterest in activities was recorded in 96.7% of participants, while 84.2% reported moderate-to-

severe difficulty focusing. Some degree of helplessness was reported by 85.8%. Moderate depression was the most frequent stated category (54 participants; 45.0%). The source depression-severity table totaled 118 classified observations and included two blank or unclassified cases; these values are retained without alteration.

Table 4. Distribution of responses to depression-related items

Item	Score 0, n (%)	Score 1, n (%)	Score 2, n (%)	Score 3, n (%)
Positive feeling	85 (70.8%)	31 (25.8%)	4 (3.3%)	0 (0.0%)
Unable to focus on tasks/activities	3 (2.5%)	16 (13.3%)	60 (50.0%)	41 (34.2%)
Hopeless about circumstances	52 (43.3%)	40 (33.3%)	20 (16.7%)	8 (6.7%)
Sinking heart/feeling sad	55 (45.8%)	46 (38.3%)	10 (8.3%)	9 (7.5%)
Disinterest in activities	4 (3.3%)	0 (0.0%)	65 (54.2%)	51 (42.5%)
Feeling helpless	17 (14.2%)	61 (50.8%)	32 (26.7%)	10 (8.3%)
Fatigue/loss of energy	46 (38.3%)	33 (27.5%)	29 (24.2%)	12 (10.0%)

Table 5. Depression severity categories

Category	n	%	Cumulative %
Blank/unclassified	2	1.7	1.7
Extremely severe	8	6.7	8.3
Mild	25	20.8	30.8
Moderate	54	45.0	75.8
Normal	8	6.7	82.5
Severe	21	17.5	100.0

The most frequent multiplied depression-sum category was 10×2 (21 participants; 17.5%). In the final depression-score distribution, score 20 was most common (21; 17.5%), followed by scores 14 (15; 12.5%) and 12 (14; 11.7%). Complete distributions are provided in Supplementary Table S2.

3.4 Postoperative pain

Postoperative VAS scores ranged from 0 to 10. The most frequent individual score was 10, reported by 31 participants (25.8%), while 19 participants (15.8%) reported no pain. Scores of 8 and 7 were reported by 12.5% and 9.2%, respectively. In the source severity classification, worst pain was the largest category (40 participants; 33.3%), followed by severe pain and no pain (19 participants; 15.8% each). Seven observations (5.8%) were not labelled in the source severity table and are retained as blank/unclassified.

Table 6. Postoperative pain scores and pain-severity categories

Pain score (VAS)				Pain severity level			
Category	n	%	Cum.%	Category	n	%	Cum.%
0	19	15.8	15.8	No pain	19	15.8	15.8
1	2	1.7	17.5	Mild pain	7	5.8	21.7
2	17	14.2	31.7	Mild	12	10.0	31.7
3	7	5.8	37.5	Moderate	8	6.7	38.3
4	2	1.7	39.2	Moderate pain	1	.8	39.2
5	5	4.2	43.3	Moderate to severe	7	5.8	45.0
6	2	1.7	45.0	Blank/unclassified (inferred)	7	5.8	50.8
7	11	9.2	54.2	Severe pain	19	15.8	66.7
8	15	12.5	66.7	Worst pain	40	33.3	100.0
9	9	7.5	74.2				
10	31	25.8	100.0				

Across the descriptive tables, patients with more marked preoperative anxiety tended to report greater postoperative pain. A similar pattern was observed for some patients with moderate-to-severe depression, although it was less consistent. Because inferential analyses were not included, the magnitude and statistical significance of these relationships cannot be determined from the available data.

4. Discussion

This study describes a high burden of psychological distress among adults awaiting elective surgery at Bacha Khan Medical Complex. Extremely severe anxiety was the most common anxiety category, and moderate depression was the most common depression category reported in the source data. High postoperative pain was also frequent: one quarter of participants recorded the maximum VAS score, and one third were classified as having worst pain. The descriptive results suggest that preoperative anxiety was more consistently aligned with postoperative pain than depression.

The anxiety-pain pattern is compatible with earlier reports from different surgical settings. Periañez and colleagues found that preoperative anxiety influenced postoperative pain more clearly than depression [1]. Studies involving laparoscopic

hysterectomy, craniotomy, orthopedic procedures and general elective surgery have similarly linked higher anxiety with greater pain, increased analgesic requirements or less favourable recovery [5,6,16,19]. Anxiety may increase sympathetic activation, narrow attention toward threat and promote catastrophizing or fear-avoidance responses, thereby amplifying the perceived intensity of postoperative sensations.

The findings concerning depression were less uniform. Depressive symptoms were common in the present sample, particularly disinterest and impaired concentration, but the observed connection with immediate pain was not as clear as the connection with anxiety. Previous research has also been mixed. Some studies have associated depressive symptoms with postoperative pain or prolonged recovery [3,8,17,18,21], whereas a recent systematic review suggested that the strength of the association may differ by postoperative interval and study design [20]. Depression is heterogeneous and may interact with treatment, social support, chronic pain, coping style and baseline functional impairment. The sample included several types of surgery, which increases clinical breadth but also introduces heterogeneity. Pain intensity, expected tissue injury, anesthesia technique and

postoperative analgesic protocols differ substantially between tonsillectomy, gynecological surgery, orthopedic procedures and major abdominal operations. The descriptive design did not adjust for these differences. Consequently, the current results should be interpreted as an initial local profile rather than evidence that anxiety or depression independently predicts pain.

4.1 Clinical implications

Brief psychological screening during preoperative assessment may help identify patients who require additional preparation. Clear explanations about anesthesia, expected pain, mobilization and recovery can reduce uncertainty. Patients with marked anxiety may benefit from structured counselling, breathing or relaxation exercises, cognitive-behavioural strategies, and—when clinically appropriate—pharmacological treatment. Screening should be linked to a practical care pathway rather than used as an isolated questionnaire.

Preoperative anxiety and depression were common among the surgical patients studied, and severe postoperative pain was frequently reported. The descriptive findings indicate that anxiety had a clearer relationship with postoperative pain than depression. Incorporating psychological

6. Recommendations for future research

Future studies should recruit larger, more diverse samples and use longitudinal designs with clearly defined assessment times. Analyses should adjust for age, sex, education, type and duration of surgery, anesthesia technique, pre-existing pain, comorbidities and analgesic exposure. Reporting correlation coefficients, effect estimates,

4.2 Strengths and limitations

A strength of the study is the inclusion of patients from several surgical specialties and the preservation of item-level psychological and pain data. Important limitations remain. The sample was recruited at a single centre by consecutive non-probability sampling, limiting generalizability. Psychological symptoms and pain were self-reported and therefore vulnerable to response and reporting bias. The study did not report inferential statistics, adjustment for confounders, timing of postoperative pain assessment, analgesic consumption, anesthesia-specific comparisons or standardized surgical severity. The initial sample-size estimate and the final analyzed sample were inconsistent, the depression-severity table totaled 118 rather than 120, and the pain-severity table contained seven unlabelled observations. These issues should be addressed in future data collection and analysis.

5. Conclusion

assessment and targeted support into routine preoperative care may improve patient preparation and pain management. Larger prospective studies using multivariable analysis and standardized postoperative assessments are needed to establish the independent effects of anxiety and depression.

confidence intervals and p values would allow the clinical importance of psychological distress to be judged. Interventional trials should also test whether counselling, relaxation, mindfulness, cognitive-behavioural approaches or appropriate anxiolytic treatment reduce postoperative pain and analgesic requirements.

Supplementary data tables

Supplementary Table S1. Complete anxiety score distributions

Sum of anxiety score ×2				Final anxiety score			
Category	n	%	Cum.%	Category	n	%	Cum.%
4×2	8	6.7	6.7	4	3	2.5	2.5
9×2	11	9.2	15.8	6	10	8.3	10.8
14×2	11	9.2	25.0	8	8	6.7	17.5
15×2	8	6.7	31.7	10	10	8.3	25.8

17×2	2	1.7	33.3	12	3	2.5	28.3
3×2	10	8.3	41.7	14	15	12.5	40.8
12×2	5	4.2	45.8	16	14	11.7	52.5
2×2	3	2.5	48.3	18	11	9.2	61.7
5×2	8	6.7	55.0	20	5	4.2	65.8
6×2	5	4.2	59.2	22	9	7.5	73.3
7×2	17	14.2	73.3	24	5	4.2	77.5
8×2	14	11.7	85.0	26	8	6.7	84.2
10×2	5	4.2	89.2	28	9	7.5	91.7
11×2	5	4.2	93.3	30	8	6.7	98.3
13×2	8	6.7	100.0	34	2	1.7	100.0

Supplementary Table S2. Complete depression score distributions

Sum of depression score ×2				Final depression score			
Category	n	%	Cum.%	Category	n	%	Cum.%
15×2	1	.8	.8	4	1	.8	.8
9×2	7	5.8	6.7	8	7	5.8	6.7
10×2	21	17.5	24.2	10	13	10.8	17.5
11×2	9	7.5	31.7	12	14	11.7	29.2
14×2	6	5.0	36.7	14	15	12.5	41.7
2×2	1	.8	37.5	16	11	9.2	50.8
4×2	7	5.8	43.3	18	7	5.8	56.7
5×2	13	10.8	54.2	20	21	17.5	74.2
6×2	14	11.7	65.8	22	7	5.8	80.0
7×2	13	10.8	76.7	24	8	6.7	86.7
8×2	11	9.2	85.8	26	6	5.0	91.7
12×2	8	6.7	92.5	28	4	3.3	95.0
13×2	6	5.0	97.5	30	3	2.5	97.5
18×2	3	2.5	100.0	32	3	2.5	100.0

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