RESEARCH ARTICLE

Frequency of preoperative anxiety and associated factors among adult surgical patients undergoing elective surgery in Civil Hospital Karachi

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Abstract

Objective: To determine the frequency of preoperative anxiety and associated factors among patients undergoing elective surgery.

Method: The cross-sectional study was conducted at Civil Hospital Karachi from June 1 to August 1, 2024, and comprised adult patients of either gender who were due to undergo elective surgery. Data was collected through face-to-face interviews using a standardised questionnaire. Anxiety levels and information needs were assessed using the Amsterdam Preoperative Anxiety and Information Scale. Data was analysed using SPSS 22.

Results: Of the 390 patients with mean age 39.93±10.73 years (range: 19-50 years), 167(42.8%) were males and 223(57.2%) were females. Overall, mean anxiety level was 14.50±4.36, with 314(80.5%) patients exhibiting high levels of preoperative anxiety compared to 76(19.5%) who reported low anxiety. Age, education level, marital status and the number of previous surgeries were significantly associated with preoperative anxiety ($p<0.05$), while systemic illnesses did not significantly correlate with anxiety ($p>0.05$).

Conclusions: The level of preoperative anxiety was found to be significantly high among patients undergoing elective surgery. Improved patient education and communication strategies can help alleviate anxiety and enhance surgical outcomes.

Keywords: Preoperative anxiety, Elective surgery, Anxiety predictors, Patient education. (JPMA 76: 557; 2026)

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Introduction

Changes in psychophysiology brought on by intrapsychic conflicts are associated with stress, which is an adverse mental state.[1] Preoperative anxiety is the term for the anxiety that patients may experience before and during surgery. The fear, tension or discomfort people feel prior to undergoing surgery is known as preoperative anxiety. It is an unsavoury sensation that is most reported as the noticeably awful part of the surgical episode. The general health of patients and the findings of procedure could both be adversely affected by preoperative anxiety.[2]

Many issues, such as an increased risk of infection, nausea, vomiting, and cardiac conditions, like tachycardia and hypertension, have been linked to preoperative worries.[3] Postoperative pain, wound-healing, suppression of immunity, circulatory problems, therapeutic efficacy, greater demand for pain-relievers, and recovery rates can all be adversely affected.[4]

Preoperative anxiety in patients is influenced by factors like age, gender, previous surgical experiences, fear of anaesthesia, disability, death, educational status, surgery type, patient's health, dependency and surgical result.[5]

Preoperative anxiety is a global issue affecting people worldwide, with a prevalence ranging from 16.7% to 97%[5] with a global pooled prevalence of 48%. Studies show a significant global impact on surgical treatment.[6] In 2023, 62% patients in Karachi's tertiary care facilities reported having preoperative anxiety, with higher rates found among female patients.[7]

Preoperative anxiety is a prevalent yet at times ignored issue that has a negative impact on surgical results by raising the need for anaesthetics, delaying recovery, and increasing the likelihood of problems after surgery. Although its high frequency has been repeatedly noted in international literature, there is little evidence from Pakistan, especially in tertiary care institutions in Karachi, where patient demographics, medical resources, and cultural beliefs may have varying effects on anxiety.[7]

It is important to assess the prevalence and contributing factors of preoperative anxiety in Pakistani population, determining demographics, delving into the medical and psychological aspects, and measuring the effectiveness of counselling interventions for preoperative anxiety.[8]

The current study was planned to address the gap in literature by determining the frequency of preoperative

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anxiety and associated factors among patients undergoing elective surgery in an urban tertiary care setting.

Patients and Methods

The descriptive, cross-sectional study was conducted at Civil Hospital Karachi (CHK) from June 1 to August 1, 2024, and comprised patients undergoing elective surgery. After approval from the ethics review board of the Dow University of Health Sciences (DUHS), Karachi, the sample size was calculated using OpenEpi calculator[9] with 95% confidence level, 5% margin of error, design effect (DEFF) 1 and a total population size of 1,000,000. The single population proportion formula was used on the basis of 53.6% prevalence preoperative anxiety.[10] The sample was raised using non-probability consecutive sampling technique from among the patients admitted to Units IV and VI of the CHK Department of Surgery. The patients were consecutively approached and invited to participate until the targetted sample size was achieved. Those included were adult patients of either gender who had been scheduled to undergo elective surgeries. Those excluded were juvenile cases, pregnant women, those undergoing paediatric, gynaecological and emergency procedures, patients with a history of mental illness, and those using anxiolytic drugs.

After taking written informed consent from all the patients, data was collected through face-to-face interviews. Questions were asked about anxiety and information preferences. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) was used to gather information on preoperative anxiety levels, mental health issues, medical history (previous operations, phobias), and demographics (age, gender, marital status, education level, etc.).[11]

The original APAIS questionnaire in English was used to ensure consistency in data processing and analysis. However, since the majority of participants lacked English-language skills, the research team verbally translated the questions and explained them in Urdu during individual discussions to ensure comprehension and accuracy of responses.

Cronbach's alpha (α=0.84) confirmed the internal consistency of APAIS in the current study, and it was pretested on a small group of patients prior to the primary data-gathering process to ensure face validity.[11] The APAIS responses were evaluated using the anxiety score and the demand for information score. The total scores given to statements concerning worries regarding sedation and the procedure were evaluated in order to figure out the anxiety score. Also, the desire for information score was obtained from responses related to the patients' desire for knowledge about anaesthesia and the surgical procedure. Higher scores on the scales indicated advanced levels of anxiety and a greater desire for information. "Not at all" to "extremely" indicated the range of the Likert scale used to evaluate the replies. APAIS anxiety score ≥11 was considered clinically significant preoperative anxiety, and an information score of ≥5 indicated high information need.

Data was analysed using SPSS 22. Data was expressed as either frequencies and percentages, or as mean ± standard deviation, as appropriate. Chi-square test and double logistic retrogression were used where necessary. For comparisons with expected cell counts <5, Fisher's Exact test was applied. Odds ratio (OR) with 95 confidence interval (CI) was also calculated. P<0.05 was considered statistically significant.

Results

Of the 390 patients with mean age 39.93±10.73 years (range: 19-50 years), 167(42.8%) were males and 223(57.2%) were females. There were 331(84.9%) patients who were married, while 157(40.3%) had attained primary education (Table 1).

There were 175(44.9%) with a history of previous operations, 99(25.4%) expressed satisfaction with their past surgical experience, and 299(76.7%) had undergone general anaesthesia (GA) (Table2).

Table-1: Demographic characteristics of the participants (n=390).

	n (%)
Age (years)	
18–20 years	17 (4.4)
20.1–40 years	170 (43.6)
40.1–60 years	203 (52.1)
Gender	
Female	223 (57.2)
Male	167 (42.8)
Marital Status	
Married	331 (84.9)
Unmarried	59 (15.1)
Education	
Did not acquire any	84 (21.5)
Graduation	41 (10.5)
Primary education	157 (40.3)
Secondary Education	108 (27.7)

Table-2: Surgical history of the patient.

	n (%)
Did you have any previous operations?	
No	215 (55.1)
Yes	175 (44.9)
Were you satisfied with past-surgical experience?	
No	291 (21.0)
Yes	99 (25.4)
Which type of anaesthesia was given?	
General	299 (76.7
Spinal	91 (23.3)

Table-3: Psychological characteristics and awareness level of the patients.

	n (%)
Are you afraid of Haemodynamics?	
No	134 (34.4)
Yes	256 (65.6)
Are you afraid of Needles?	
No	347 (89.0)
Yes	43 (11.0)
Are you afraid of Anaesthesia?	
No	203 (52)
Yes	187 (47.9)
Are you afraid of Death due to Surgery?	
No	80 (20.5)
Yes	310 (79.5)
Are you afraid of Surgery Failure?	
No	154 (39.5)
Yes	236 (60.5)
Have you been provided information regarding Diagnosis?	
Yes	390 (100)
Have you been provided information regarding Surgical Procedure?	
Yes	390 (100.0
Have you been provided information regarding Anaesthesia?	
Yes	390 (100)
Have you been provided information regarding post-operative complications?	
Yes	390 (100)
History of any psychiatric drug use?	
No	390 (100)
Do you have any history of phobia?	
No	384 (98.5)
Yes	6 (1.5)
Do you have any addiction?	
No	252 64.6)
Yes	138 (35.4)

Table-4: APAIS scale components and their scores.

	n	Minimum	Maximum	Mean±SD
1. The surgical anaesthesia concerns me.	390	1	5	3.79±1.39
2. I can't stop thinking about anaesthesia	390	1	5	3.45±1.46
3. I would like to acquire knowledge about anaesthetics.	390	1	5	2.51±1.23
4. I am concerned about the entire procedure.	390	1	5	3.64±1.49
5. I contemplate how it works all the time.	390	1	5	3.62±1.51
6. I would like to discover about the anaesthesia procedure.	390	1	5	3.52±1.318
Total Anxiety Score	390	4.00	20.00	14.50±4.36
Total Info Recode	390	2.00	10.00	6.03±2.17

Table-5: Prevalence of preoperative anxiety among the patients.

Anxiety Level	n	Valid Percent	Cumulative Percent
Low (0.00)	76	19.5	19.5
High (1.00)	314	80.5	80.5
Total	390	100.0	100.0

Table-6: Correlation between anxiety scores and need for information.

Information requirement category	Sample size (n =390)	Total anxiety (Mean±SD)	*p*-value
Low (2–4)	79 (20.2%)	11.5190±4.35849	0.000
Intermediate (5–7)	227 (58.2%)	15.4493±4.32331	
High (8–10)	84 (21.5%)	14.7500±3.11960	

SD: Standard deviation.

Of all the participants, 256(65.6%) reported a fear of blood loss, 43(11%), feared needles, and 187(47.9%) expressed anxiety about anaesthesia. Most patients was afraid of death due to surgery 310(79.5%) and the possibility of surgical failure 236(60.5%). All the 390(100%) participants said they had been informed about their diagnosis, the surgical procedure, and the type of anaesthesia that would be administered (Table 3).

Overall, mean anxiety score was 14.50±4.36 (Table 4), with 314(80.5%) patients exhibiting high levels of preoperative anxiety compared to 76(19.5%) who reported low anxiety (Table 5).

Most patients 227(58.2%) had an intermediate need for information, and those with this level of requirement exhibited significantly higher anxiety ($p<0.05$). The mean total anxiety score was highest among respondents with an intermediate need for information, recorded at 15.4493±4.32331, and lowest for those with a low need for information, recorded at 11.5190±4.35849 ($p<0.05$) (Table 6).

Age, education level, marital status and the number of previous surgeries were significantly associated with preoperative anxiety ($p<0.05$), while systemic illnesses did not significantly correlate with anxiety ($p>0.05$) (Table 7).

Table-7: Factors linked to the participants' medically severe preoperative anxiety.

	Significant anxiety (n 390) **Yes** [n (%)]	**No** [n (%)]	χ^2	*p*-value
Age groups				
18–20 years (n=17)	15 (88.2)	2 (11.8)	7.946	0.019
20.1–40 years (n=170)	126 (74.1)	44 (25.9)		
40.1–60 years (n=203)	173 (85.2)	30 (14.8)		
Gender				
Male (n=167)	131 (78.4)	36 (21.6)	0.797	0.372
Female (n=223)	183 (82.1)	40 (17.9)		
Educational attainment				
Did not acquire any (n=84)	70 (83.3)	14 (16.7)	7.713	0.052
Primary education (n=157)	116 (73.9)	41 (26.1)		
Secondary education (n=108)	92 (85.2)	16 (14.8)		
Tertiary education (n=40)	35 (87.5)	5 (12.5)		
Previous surgery				
Yes (n=175)	144 (82.3)	31 (17.7)	0.536	0.425
No (n=215)	170 (79.1)	45 (20.9)		
Marital status				
Unmarried (n=59)	54 (91.5)	5 (8.5)	5.373	0.020
Married (n=331)	275 (79.1)	56 (20.9)		
Number of past surgeries				
1 (n=86)	67 (77.9)	19 (22.1)	10.882	0.012
2 (n=75)	66 (88.0)	9 (12.0)		
3 (n=5)	2 (40.0)	3 (60.0)		
Anaesthetic technique				
General anaesthesia (n=299)	245 (81.9)	54 (18.1)	1.663	0.197
Local anaesthesia (n=91)	69 (75.8)	22 (24.2)		
History of Addiction				
Yes (n=138)	109 (79.0)	29 (21.0)	0.318	0.573
No (n=252)	205 (81.3)	47 (18.7)		

Factors linked to the participants' medically severe preoperative anxiety.

Table-8: Factors linked with preoperative anxiety.

Factor	Sig.	Exp(B)	95% CI Lower	95% CI Upper
Age (years)				
18–20	0.736	1.301	0.283	5.979
20.1–40+	0.008	0.497	0.296	0.833
Education				
Did not acquire any	0.515	0.694	0.232	2.081
Primary education	0.067	0.393	0.144	1.069
Secondary education	0.682	0.799	0.272	2.341
Gender				
Gender	0.372	1.257	0.760	2.079
Marital status				
Marital status	0.026	2.949	1.137	7.649
Anaesthesia type				
Anaesthesia type	0.199	0.691	0.394	1.214
Other Associated Factors				
Stay in Hospital=Yes	0.003	2.720	1.415	5.228
Postoperative pain =Yes	0.000	8.700	3.328	22.740
Family concern=Yes	0.009	2.345	1.238	4.441
Hazards/Accidents during surgery=Yes	0.000	12.461	6.152	25.241
Financial Instability=Yes	0.000	3.814	1.959	7.427
Poor social support=Yes	0.001	3.339	1.661	6.711
Psychological Factors				
Afraid of Haemodynamics=Yes	0.000	15.551	—	—
Afraid of Needles=Yes	0.404	1.800	—	—
Afraid of Anaesthesia=Yes	0.001	3.350	—	—
Afraid of Death due to surgery=Yes	0.000	4.233	—	—
Afraid of Surgery Failure=Yes	0.080	1.851	—	—

*p< 0.05 is considered statistically significant; P-values computed using Fisher's Exact Test where expected counts were <5; CI: Confidence interval.

The odds of experiencing preoperative anxiety were 2.949 times higher for married individuals compared to those not married (p=0.026), 2.720 times higher for hospital stay (p=0.003), 8.700 times higher for postoperative pain (p<0.001), 2.345 times higher for family concerns (p=0.009), 12.461 times higher for surgical hazards or accidents (p<0.001), 3.814 times higher for financial instability (p<0.001), and 3.339 times higher for poor social support (p=0.001) (Table 8).

Fear of haemodynamic complications was associated with a 15.55-fold increase in the likelihood of preoperative anxiety (p<0.001). Fear of anaesthesia increased the likelihood by 3.35 times (p=0.001), and fear of death due to surgery increased it by 4.23 times (p<0.001). Fear of needles did not significantly predict anxiety (p=0.404), while fear of surgery failure showed marginal significance (p=0.080) (Table 8).

Discussion

The current study found that 80.5% of the patients experienced high preoperative anxiety, with a mean score of 14.5 for overall anxiety and 6.03 for need for information. Despite the fact that a number of techniques have been developed for determining a patient's extent of preoperative anxiety, the current study chose the APAIS tool because it was straightforward and easy-to-understand, comprising only four anxiety-related questions and two information-needing questions.[12] Compared to a prior study in Pakistan that determined the preoperative anxiety's prevalence, the current study had a larger sample size.[13] Compared to research carried out elsewhere, which reported frequencies of 25.85% in Nepal,[14] 24.4% in Nigeria,[15] 53.6% in Ethiopia[16] and 58.1% in India,[17] the current study's had higher prevalence of preoperative anxiety. The current results, however, were similar to the overall prevalence of preoperative anxiety reported from Sri Lanka[18] and Mexico.[19]

The current study noted that a significant proportion of participants reported high levels of preoperative anxiety, and patients with intermediate information demand had significantly high anxiety. This varied with a study which showed significantly high anxiety levels among those with a low need for information.[15] Age was identified as a contributing factor, with advanced age associated with higher frequency of anxiety, but this finding was different from what Jafar et al. reported.[20] Married individuals were more likely to suffer from preoperative anxiety, according to the current results. This contradicts a research that found no meaningful correlation between preoperative anxiety and marital status.[21] The current study also indicated that patients who had at least one prior surgery had high anxiety levels, which was in contrast to the results of Jafar et al.[20]

It is important to determine the factors of preoperative anxiety to effectively manage the wellbeing of patients before surgery. The factors noted included the fear of postoperative pain, hazards or accidents during surgery, stay in the hospital, family concerns, financial instability, and poor social support. These factors were similar to those reported earlier.[22]

The main reasons that contribute to the highest prevalence of preoperative anxiety in Pakistan, a developing country, are insufficient health services and management, presence of communication gap between patients and doctors, patients having limited literacy, and having little confidence in physicians. With a poor healthcare system, Physicians have a lot of patients to see in a short amount of time, and, under such circumstances, efforts to provide adequate information to all patients regarding their planned procedure may not be possible to satisfy individual patient's concerns.[21]

In addition to raising the risk of surgical complications. including discomfort, vomiting, nausea, circulatory instability, neuropsychological dysfunction, and the need for sedation, preoperative anxiety can further increase healthcare costs, prolong hospitalisations, and impact long-term prognoses by increasing sympathetic impulses

or myocardial oxygen use.[23]

The current study has certain limitations. Rather than before or after going into the operating room on the day of the surgery, the anxiety level was determined on the day before the procedure. Previous studies have shown that the level of worry rises at various times, peaking just before going into the surgery room.[24] Secondly, only the APAIS scale was used when two or more psychometric scales for the assessment of anxiety could have proven better to completely validate the findings. Since in-person interviews were used to gather data, social desirability bias could not be completely ruled out. Lastly, paediatric, gynaecological, obstetrical and emergency surgeries were excluded.

Conclusion

The prevalence of preoperative anxiety was found to be high, and a number of factors correlated to higher levels of anxiety. In order to manage anxiety, raised patient satisfaction, and optimise surgical results, improved patient education and efficient communication techniques are required.

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References

1. Cui X, Zhu B, Zhao J, Huang Y, Luo A, Wei J. Parental state anxiety correlates with preoperative anxiety in Chinese preschool children. J Paediatr Child Health. 2016;52:649–55. doi: 10.1111/jpc.13202
2. Shebl MA, Toraih E, Shebl M, Tolba AM, Ahmed P, Banga HS, et al. Preoperative anxiety and its impact on surgical outcomes: a systematic review and meta-analysis. J Clin Transl Sci. 2025;9:e33.
3. Pokharel K, Bhattarai B, Tripathi M, Khatiwada S, Subedi A. Nepalese patients' anxiety and concerns before surgery. J Clin Anesth. 2011;23:372–8.

doi: 10.1016/j.jclinane.2010.12.011

4. Tadesse M, Ahmed S, Regassa T, Girma T, Hailu S, Mohammed A, et al. Effect of preoperative anxiety on postoperative pain in patients undergoing elective surgery: prospective cohort study. Ann Med Surg. 2022;73:103-190.
5. Ghimire R, Poudel P. Preoperative anxiety and its determinants among patients scheduled for major surgery: a hospital-based study. Int J Anaesth Clin Med. 2019;6:57–60.
6. Abate SM, Chekol YA, Basu B. Global prevalence and determinants of preoperative anxiety among surgical patients: a systematic review and meta-analysis. Int J Surg Open. 2020;25:6–16.
7. Parveen S, Khan NA, Waseem HF, Bakhsh MM, Aziz A. Frequency of anxiety in pre-operative surgical patients in tertiary care hospitals, Karachi. J Health Rehabil Res. 2024;4:1587–96.
8. Nwosu Arinze DG, Anikwe I, Eze B, Ossai E, Onyekwulu F. Amputation-related phantom limb pain in Nigeria: a prospective cohort study. Niger J Med. 2020;29:208.
9. Dean AG, Sullivan KM, Soe MM. OpenEpi: open source epidemiologic statistics for public health, version 3.01. 2013.
10. Moerman N, van Dam FS, Muller MJ, Oosting H. The Amsterdam preoperative anxiety and information scale (APAIS). Anesth Analg. 1996;82:445–51.doi: 10.1097/00000539-199603000-00003
11. Shewangzaw Engda A, Belay Yigzaw H, Alemnew Engdaw N, Admasu Basha E, Adem A, Dargie Wubetu A, et al. Magnitude of preoperative anxiety and associated factors among adult surgical patients. Int J Gen Med. 2022;15:5999–6007.
12. Moerman N, van Dam FS, Muller MJ, Oosting H. The Amsterdam Preoperative Anxiety and Information Scale (APAIS). Anesth Analg. 1996; 82:445–51. doi: 10.1097/00000539-199603000-00003
13. Alkayed NJ, Murphy SJ, Traystman RJ, Hurn PD, Miller VM. Neuroprotective effects of female gonadal steroids in reproductively senescent female rats. Stroke. 2000;31:161–8.doi: 10.1161/01.STR.31.1.161
14. Adhikari SP, Pathak BD, Ghimire B, Baniya S, Joshi P, Kafle P, et al. Prevalence of pre-operative anxiety and associated risk factors among patients awaiting elective surgery. F1000Res. 2023;12:1207.
15. Ossai EN, Nwosu ADG, Onwuasoigwe O, Ubboe K, Ameh J, Alu L. Prevalence and predictors of anxiety among surgical patients in the preoperative holding area. J West Afr Coll Surg. 2023;13:105–12.
16. Shewangzaw Engda A, Belay Yigzaw H, Alemnew Engdaw N, Admasu Basha E, Adem A, Dargie Wubetu A, et al. Magnitude of preoperative anxiety and associated factors among adult surgical patients. Int J Gen Med. 2022;15:5999–6007.
17. Jiwanmall M, Jiwanmall SA, Williams A, Kamakshi S, Sugirtharaj L, Poornima K, et al. Preoperative anxiety in adult patients undergoing day care surgery. Indian J Psychol Med. 2020;42:87–92.
18. Matthias AT, Samarasekera DN. Preoperative anxiety in surgical patients: experience of a single unit. Acta Anaesthesiol Taiwan. 2012;50:3–6. doi: 10.1016/j.aat.2012.02.002
19. Valenzuela Millán J, Barrera Serrano JR, Ornelas Aguirre JM. Anxiety in preoperative anesthetic procedures. Cir Cir. 2010;78:147–51. doi: 10.1016/S0009-7411(10)70024-1
20. Jafar MF, Khan FA. Frequency of preoperative anxiety in Pakistani surgical patients. J Pak Med Assoc. 2009;59:359–63.
21. Farooqui A, Khalid Jamil OB, Muhib M, Shahid A, Maqsood A, Lari A, et al. Psychometric evaluation of Urdu-translated APAIS. SAGE Open Med. 2023;11:20503121231208264.
22. Mulugeta H, Ayana M, Sintayehu M, Dessie G, Zewdu T. Preoperative anxiety and associated factors among adult surgical patients. BMC Anesthesiol. 2018;18:155.doi: 10.1186/s12871-018-0627-0
23. Ni K, Zhu J, Ma Z. Preoperative anxiety and postoperative adverse events: a narrative overview. Anesthesiol Perioper Sci. 2023;1:23.
24. Kumar A, Dubey PK, Ranjan A. Assessment of anxiety in surgical patients: an observational study. Anesth Essays Res. 2019;13:503–8. doi: 10.4103/aer.AER_93_19

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EK: Review, editing and supervision.
AM: Review, editing, data collection and supervision.
RM: Concept, writing original draft and supervision.
RZ: Concept and writing original draft.
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