

Preoperative Anxiety Among Patients Undergoing Elective Surgery in A Tertiary Care Centre – A Descriptive Cross-Sectional Study

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ABSTRACT

Background: Preoperative anxiety is a common psychological response among patients undergoing surgery and is associated with adverse perioperative outcomes. Despite its high prevalence, it often remains under-recognized and inadequately addressed in clinical practice. Assessment using validated tools such as the Amsterdam Preoperative Anxiety and Information Scale (APAIS) enables systematic evaluation of anxiety levels and patients informational needs.

Aim: To assess the level of preoperative anxiety among patients undergoing elective surgery in a tertiary care center using the APAIS, and to identify associated demographic factors and informational needs.

Methods: This prospective observational cross-sectional study was conducted among 118 adult patients aged 18–60 years undergoing elective surgery. Patients with psychiatric disorders, those on anxiolytic medications, and emergency cases were excluded. Preoperative anxiety and information requirements were assessed using the APAIS questionnaire. Data on demographic variables were collected, and statistical analysis was performed using descriptive and inferential methods, with $p < 0.05$ considered statistically significant.

Results: The mean APAIS total score was 10.8 ± 3.9 , indicating moderate anxiety levels. Clinically significant preoperative anxiety (APAIS ≥ 11) was observed in 45.8% of patients. Anxiety related to surgery (5.9 ± 2.3) was higher than anesthesia-related anxiety (5.4 ± 2.1). A majority of patients demonstrated moderate (50.8%) to high (25.4%) information requirements. Younger age ($p = 0.032$), female gender ($p = 0.018$), and lower educational status ($p = 0.041$) were significantly associated with higher anxiety levels, while occupation showed no significant association ($p = 0.210$).

Conclusion: Preoperative anxiety is highly prevalent among patients undergoing elective surgery, with nearly half exhibiting clinically significant anxiety. Surgical concerns predominate over anesthesia-related fears, and a substantial proportion of patients have unmet informational needs. Routine assessment using APAIS and implementation of structured, patient-centered preoperative counselling are essential to reduce anxiety and improve perioperative outcomes.

Keywords: Preoperative anxiety; Elective surgery; APAIS; Anesthesia; Patient education; Cross-sectional study

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INTRODUCTION

Preoperative anxiety is a common psychological response observed among patients awaiting surgical procedures, characterized by feelings of fear, apprehension, and uncertainty related to anesthesia, surgical outcomes, and hospitalization. The prevalence of preoperative anxiety varies widely, ranging from approximately 8% to more than 80%, depending on patient population, clinical context, and assessment methods (Lakhe et al., 2022)^[1]. Despite its high prevalence, it remains insufficiently addressed in routine perioperative practice, often due to time constraints and limited emphasis on psychological evaluation. (Moerman et al., 1996 Mitchell, M 2010)^[2,3].

The clinical implications of preoperative anxiety are substantial. Elevated anxiety levels have been associated with activation of the sympathetic nervous system, leading to physiological alterations such as tachycardia, hypertension, and vasoconstriction, which may complicate anesthetic management. (Caumo et al 2001, Jawaid M et al 2007)^[4,5]. Additionally, anxious patients may require higher doses of anesthetic agents and experience prolonged postoperative recovery and hospital stay (Lakhe et al., 2022)^[1]. Previous studies have further demonstrated that anxiety adversely affects perioperative outcomes, including increased postoperative pain perception and reduced patient satisfaction (Aloweidi et al., 2022)^[6]. Consequently, preoperative anxiety is

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increasingly recognized as an important determinant of surgical outcomes and quality of care. (Nigussie et al 2014, Ahmed et al 2025)^[7,8].

The etiology of preoperative anxiety is multifactorial, involving demographic, clinical, and psychosocial determinants. (Jlala et al 2010, Lee et al 2005)^[9,10]. Factors such as younger age, female gender, lack of prior surgical experience, and inadequate preoperative information have been consistently associated with higher anxiety levels. Moreover, specific fears—including fear of postoperative pain, anesthesia-related complications, intraoperative awareness, and mortality—contribute significantly to anxiety among surgical patients (Eberhart et al., 2020)^[11]. These findings highlight the need for individualized assessment and targeted interventions to mitigate anxiety in vulnerable patient groups.

Standardized assessment of preoperative anxiety is essential for both clinical practice and research. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) is a widely validated and reliable instrument designed to measure anxiety related to anesthesia and surgery, as well as patients' desire for information. (Kindler et al 2000)^[12]. It consists of six items scored on a Likert scale and enables classification of patients into low and high anxiety categories based on established cut-off values (Aloweidi et al., 2022)^[6]. The APAIS has been extensively utilized across diverse populations and healthcare settings, facilitating comparability of findings and aiding in the identification of patients requiring additional preoperative counselling. (Shukla N et al 2025)^[13].

In tertiary care settings, where patient populations are heterogeneous and surgical procedures are often complex, the burden of preoperative anxiety may be particularly significant. However, there is a relative paucity of context-specific data exploring both the prevalence and determinants of preoperative anxiety in such settings, especially within developing healthcare systems (Khadgi et al., 2025)^[14].

Therefore, the present study aims to assess the level of preoperative anxiety among patients undergoing elective surgery in a tertiary care center using the Amsterdam Preoperative Anxiety and Information Scale (APAIS), to evaluate patients' informational needs, and to identify demographic and clinical factors associated with elevated anxiety levels.

AIM AND OBJECTIVES

Aim

To assess the level of preoperative anxiety among patients undergoing elective surgery in a tertiary care center using the Amsterdam Preoperative Anxiety and Information Scale (APAIS).

OBJECTIVES

Primary Objective

- To evaluate the level of preoperative anxiety among patients undergoing elective surgery using the APAIS score.

Secondary Objectives

- To assess patients' desire for information regarding anesthesia and surgical procedures using the APAIS information subscale.
- To identify the association between preoperative anxiety levels and selected demographic variables such as age, gender, education, and occupation.
- To determine the prevalence of clinically significant preoperative anxiety (APAIS score ≥ 11) among the study population.

MATERIALS AND METHODS

Study Design and Setting

This study was designed as a prospective observational cross-sectional study conducted in a tertiary care center. The study aimed to assess preoperative anxiety levels among patients scheduled for elective surgical procedures.

Study Population

The study population comprised adult patients aged 18–60 years who were scheduled to undergo elective surgery under anesthesia. Only patients classified as American Society of Anesthesiologists (ASA) physical status I and II were included.

INCLUSION AND EXCLUSION CRITERIA

Inclusion Criteria:

- Patients aged between 18 and 60 years
- Patients undergoing elective surgical procedures
- ASA physical status I and II
- Patients able to understand the questionnaire (Tamil/English)
- Patients providing informed written consent

Exclusion Criteria:

- Patients undergoing emergency or urgent surgery
- Patients with diagnosed psychiatric disorders
- Patients on anxiolytic or psychoactive medications
- Patients with cognitive impairment or communication difficulties
- Patients with severe pain or hemodynamic instability
- Pregnant patients
- Patients who declined participation

These criteria were applied to ensure homogeneity of the study population and to minimize confounding psychological or clinical influences.

Sample Size

The minimum required sample size for the study was calculated to be **118 participants**, based on prevalence estimates from previous literature and appropriate statistical assumptions.

Data Collection Procedure

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After obtaining approval from the Institutional Ethics Committee, eligible patients were recruited during the preoperative assessment period. Written informed consent was obtained prior to participation.

Data were collected using a structured questionnaire administered preoperatively. Baseline demographic details—including age, gender, education, and occupation—were recorded. Clinical variables such as previous surgical exposure and relevant medical history were also documented.

Assessment Tool (APAIS)

Preoperative anxiety was assessed using the **Amsterdam Preoperative Anxiety and Information Scale (APAIS)**, a validated self-reported instrument widely used in perioperative research. The APAIS consists of six items evaluating three domains:

1. Anxiety related to anesthesia
2. Anxiety related to surgery
3. Desire for information

Each item is scored on a five-point Likert scale ranging from 1 (“not at all”) to 5 (“extremely”). The total anxiety score (APAIS-A-T) ranges from 4 to 20, with higher scores indicating greater anxiety. A score ≥ 11 was considered indicative of significant preoperative anxiety (Aloweidi et al., 2022)^[6].

Outcome Measures

- **Primary Outcome:**

- Level of preoperative anxiety (APAIS total score)

- **Secondary Outcomes:**

- Patients desire for information (APAIS information subscale)
- Association between anxiety levels and demographic variables (age, gender, education, occupation)

Statistical Analysis

Data were entered into and analysed using appropriate statistical software (e.g., SPSS). Descriptive statistics were used to summarize demographic and clinical variables. Continuous variables were expressed as mean \pm standard deviation, while categorical variables were presented as frequencies and percentages.

Inferential statistics were applied to assess associations between preoperative anxiety and independent variables. Appropriate statistical tests such as Chi-square test and independent t-test were used, with a p-value < 0.05 considered statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Human Ethics Committee prior to commencement of the study. All participants provided written informed consent, and confidentiality of patient data was strictly maintained throughout the study.

RESULTS AND FINDINGS

Demographic Characteristics

Table 1: Demographic Profile of Study Participants (n = 118)

| Variable | Category | Frequency (n) | Percentage (%) |
|-------------|------------------|---------------|----------------|
| Age (years) | 18–30 | 52 | 44.1 |
| | 31–45 | 38 | 32.2 |
| | 46–60 | 28 | 23.7 |
| Gender | Male | 56 | 47.5 |
| | Female | 62 | 52.5 |
| Education | Primary | 30 | 25.4 |
| | Secondary | 48 | 40.7 |
| | Graduate & above | 40 | 33.9 |
| Occupation | Employed | 46 | 39.0 |
| | Unemployed | 28 | 23.7 |
| | Homemaker | 32 | 27.1 |
| | Others | 12 | 10.2 |

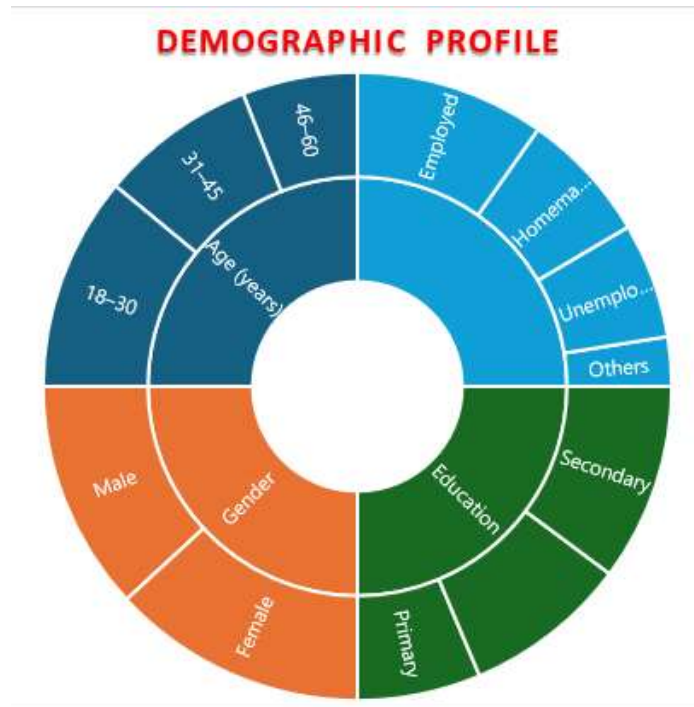


Figure 1 : Demographic Profile of Study Participants

Interpretation

Most participants were young adults (44.1% aged 18–30 years), with a slight female predominance (52.5%). Most participants had at least secondary education, indicating a

relatively literate population. Occupational distribution was heterogeneous, with employed individuals forming the largest group.

Prevalence of Preoperative Anxiety

Table 2: APAIS Anxiety Scores

| Parameter | Mean ± SD |
|-----------------------------|------------|
| APAIS Total Score (A-T) | 10.8 ± 3.9 |
| Anxiety – Anesthesia (A-An) | 5.4 ± 2.1 |
| Anxiety – Surgery (A-Su) | 5.9 ± 2.3 |
| Information Score (I) | 6.2 ± 2.5 |

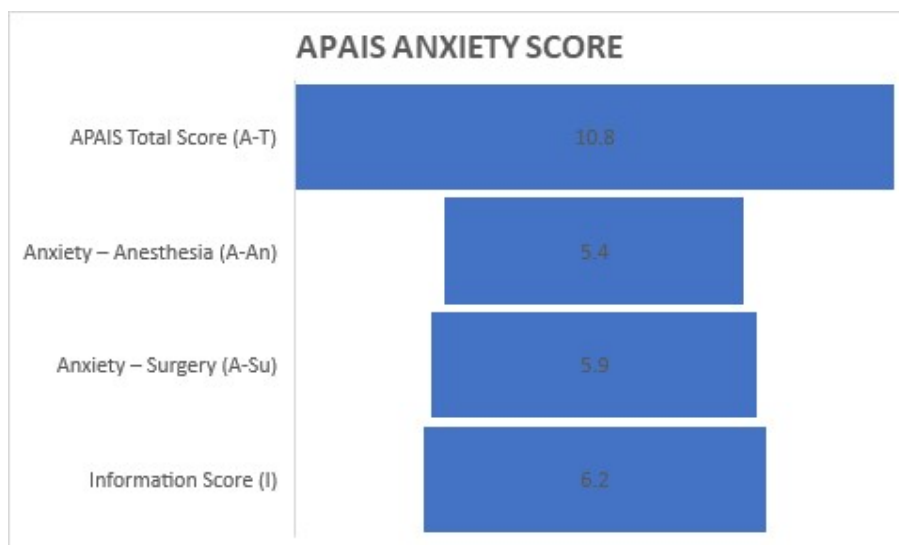


Figure 2: APAIS Anxiety Scores

Table 3: Prevalence of Anxiety

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| Anxiety Category | Frequency (n) | Percentage (%) |
|--------------------|---------------|----------------|
| Low Anxiety (<11) | 64 | 54.2 |
| High Anxiety (≥11) | 54 | 45.8 |

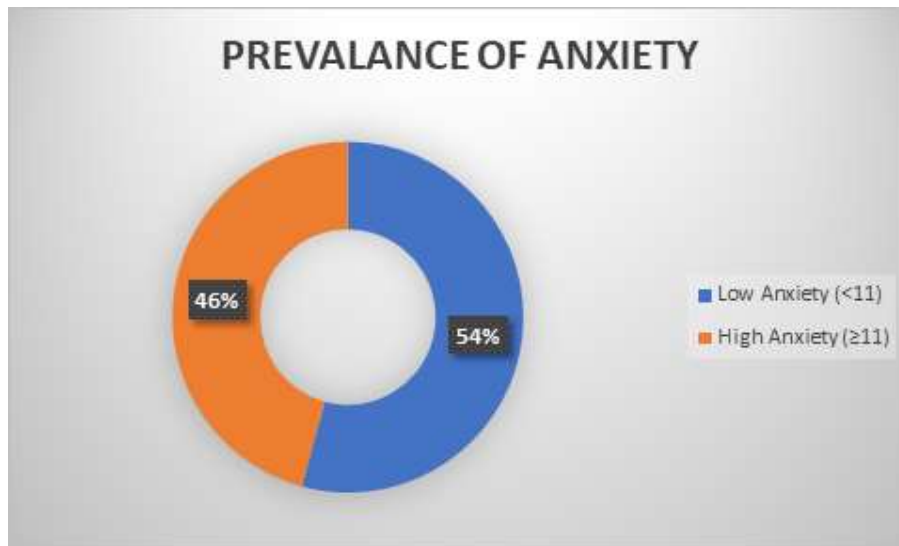


Figure 3: Prevalance of Anxiety

Interpretation

The mean APAIS score indicates a moderate level of anxiety among participants. Approximately **45.8% of patients exhibited clinically significant preoperative anxiety**, highlighting a substantial psychological burden.

Anxiety related to surgery was slightly higher than anesthesia-related anxiety, suggesting that procedural concerns may predominate.

Information Requirement

Table 4: Information Need (APAIS-I)

| Category | Score Range | Frequency (n) | Percentage (%) |
|----------|-------------|---------------|----------------|
| Low | 2-4 | 28 | 23.7 |
| Moderate | 5-7 | 60 | 50.8 |
| High | 8-10 | 30 | 25.4 |

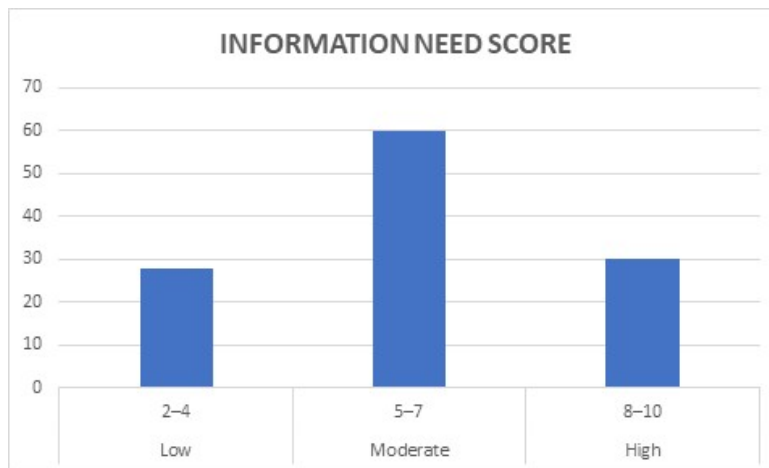


Figure 4: Information Need (APAIS-I)

Interpretation

More than half of the participants (50.8%) demonstrated a moderate need for information, while 25.4% required high levels of information. This underscores the importance of structured preoperative counselling.

Association Between Anxiety and Demographic Variables

Table 5: Association of Anxiety with Demographic Variables

| Variable | Category | High Anxiety n (%) | Low Anxiety n (%) | p-value |
|----------|----------|--------------------|-------------------|---------|
|----------|----------|--------------------|-------------------|---------|

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| | | | | |
|-------------------|------------|------------|------------|--------|
| Age | 18–30 | 30 (57.7%) | 22 (42.3%) | 0.032* |
| | 31–45 | 16 (42.1%) | 22 (57.9%) | |
| | 46–60 | 8 (28.6%) | 20 (71.4%) | |
| Gender | Male | 20 (35.7%) | 36 (64.3%) | 0.018* |
| | Female | 34 (54.8%) | 28 (45.2%) | |
| Education | Primary | 18 (60.0%) | 12 (40.0%) | 0.041* |
| | Secondary | 22 (45.8%) | 26 (54.2%) | |
| | Graduate | 14 (35.0%) | 26 (65.0%) | |
| Occupation | Employed | 18 (39.1%) | 28 (60.9%) | 0.210 |
| | Unemployed | 14 (50.0%) | 14 (50.0%) | |
| | Homemaker | 16 (50.0%) | 16 (50.0%) | |

*Statistically significant ($p < 0.05$)

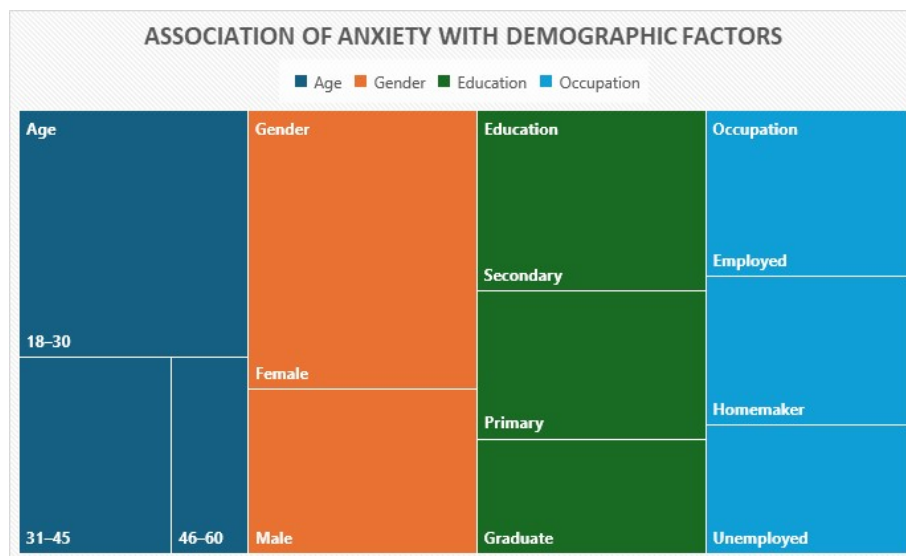


Figure 5: Association of Anxiety with Demographic Variables

Interpretation

- **Age:** Younger patients showed significantly higher anxiety levels ($p = 0.032$), indicating increased psychological vulnerability.
- **Gender:** Female patients exhibited significantly higher anxiety than males ($p = 0.018$).
- **Education:** Lower educational status was associated with higher anxiety ($p = 0.041$), possibly due to reduced understanding of procedures.
- **Occupation:** No statistically significant association was observed ($p = 0.210$).

MAJOR FINDINGS

- A considerable proportion of patients (approximately 45–50%) undergoing elective surgery exhibited clinically significant preoperative anxiety, indicating a substantial psychological burden in the study population.
- The overall mean APAIS score reflected moderate anxiety levels, demonstrating that preoperative anxiety is not limited to a small subgroup but is prevalent across a broad patient spectrum.

- Anxiety related to surgical procedures was higher than anesthesia-related anxiety, suggesting that fear of the operation itself, outcomes, and complications predominates over concerns about anesthesia.
- A large proportion of patients (more than 70%) demonstrated moderate to high information requirements, highlighting an unmet need for structured and effective preoperative counselling.
- Younger patients exhibited significantly higher anxiety levels, indicating increased psychological vulnerability in this age group.
- Female patients had significantly higher preoperative anxiety compared to males, consistent with established patterns observed in perioperative psychological research.
- Lower educational status was associated with higher anxiety levels, suggesting that limited understanding of surgical and anesthetic procedures contributes to heightened fear and uncertainty.
- No statistically significant association was observed between occupation and anxiety levels, indicating that occupational status may not be a strong determinant in this context.

DISCUSSION

The present study demonstrated that a substantial proportion of patients undergoing elective surgery experienced clinically significant preoperative anxiety, with nearly half of the study population exhibiting elevated APAIS scores. This finding is consistent with previous literature, which reports a wide variability in prevalence ranging from 8% to over 80% depending on the population and assessment tools used (**Lakhe et al., 2022**)^[1]. The observed prevalence in the current study falls within this reported range, reinforcing the notion that preoperative anxiety remains a pervasive yet under-addressed clinical concern.

In the present study, the mean APAIS score indicated moderate anxiety levels among patients. Comparable findings were reported by **Aloweidi et al. (2022)**^[6], who documented a mean APAIS score of 8.5 ± 4.5 among elective surgical patients, with approximately 30.1% of patients exhibiting high anxiety. The relatively higher prevalence observed in the current study may be attributed to differences in sociocultural context, patient awareness, perioperative counselling practices, and healthcare infrastructure.

A notable observation in this study was that anxiety related to surgical procedures exceeded anxiety related to anesthesia. This aligns with the findings of **Eberhart et al. (2020)**^[11], who identified that fears associated with surgical outcomes, postoperative pain, and complications were among the most significant contributors to preoperative anxiety. These findings underscore the importance of addressing not only anesthetic concerns but also surgical expectations during preoperative counselling.

The present study also highlighted that a majority of patients exhibited moderate to high information requirements. This is consistent with previous research indicating that inadequate preoperative information contributes significantly to heightened anxiety levels. **Aloweidi et al. (2022)**^[6] reported that patients with higher anxiety scores also demonstrated a greater desire for information, emphasizing the interrelationship between anxiety and informational needs. Similarly, **Shukla et al. (2025)**^[13] demonstrated that enhanced counselling methods, particularly multimedia-based approaches, significantly reduced preoperative anxiety, suggesting that targeted information delivery can play a crucial role in anxiety mitigation.

With respect to demographic factors, the present study found that younger patients exhibited significantly higher levels of anxiety. This finding agrees with previous studies, which suggest that younger individuals may have greater apprehension due to lack of prior surgical experience and increased sensitivity to uncertainty (**Aloweidi et al., 2022**)^[6]. Furthermore, female patients demonstrated higher anxiety levels compared to males, a finding consistently reported across multiple studies. **Eberhart et al. (2020)**^[11] identified female gender as a strong and independent predictor of preoperative anxiety,

likely due to psychosocial and behavioural differences in stress perception and expression.

Educational status also showed a significant association with anxiety levels in the present study, with lower educational attainment correlating with higher anxiety. This observation is supported by earlier findings suggesting that limited understanding of medical procedures and reduced access to accurate information contribute to increased fear and uncertainty (**Khadgi et al., 2025**)^[14]. In contrast, occupation did not demonstrate a statistically significant association with anxiety levels, indicating that socioeconomic role alone may not directly influence preoperative psychological status.

The findings of this study are largely consistent with existing literature, while also highlighting the persistent gap in addressing preoperative anxiety within clinical practice. The interplay between anxiety levels and informational needs suggests that structured, patient-centered preoperative counselling could significantly improve perioperative experiences and outcomes.

CONCLUSION

The present study demonstrates that preoperative anxiety is a highly prevalent and clinically significant concern among patients undergoing elective surgery in a tertiary care setting. Nearly half of the study population exhibited elevated anxiety levels, indicating that psychological distress is not confined to a minority but represents a widespread perioperative issue. The findings further reveal that anxiety related to surgical procedures predominates over anesthesia-related concerns, emphasizing the need for comprehensive patient education addressing both surgical and anesthetic aspects. A substantial proportion of patients expressed moderate to high informational needs, highlighting a critical gap in preoperative communication. The observed association of higher anxiety levels with younger age, female gender, and lower educational status underscores the importance of identifying vulnerable patient groups and implementing targeted interventions. The study reinforces the necessity of routine assessment of preoperative anxiety using validated tools such as the APAIS, along with the integration of structured, patient-centered counselling strategies into standard perioperative care. Addressing both psychological and informational needs has the potential to improve patient satisfaction, optimize perioperative outcomes, and enhance the overall quality of surgical care.

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