

Original article

Impact of Pre-Operative Consultation on Patient Anxiety and Surgical Outcomes Across Genders in Relation to Literacy Level

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ABSTRACT

Background: Preoperative anxiety is common among surgical patients and may influence physiological responses and perioperative experiences. Preoperative consultation may address patient concerns, although anxiety and information needs may vary according to individual characteristics. **Objective:** To assess preoperative anxiety and information needs among elective surgical patients receiving preoperative consultation, compare these measures according to gender and educational level, and examine their relationship with selected perioperative outcomes. **Methods:** This comparative observational study included 52 elective surgical patients recruited from two tertiary-care hospitals in Lahore, Pakistan, from January to April 2025. Preoperative anxiety and information needs were assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS). Gender and educational-level comparisons and correlations with physiological and postoperative outcomes were analyzed using appropriate non-parametric tests and Pearson's correlation. **Results:** The mean APAIS anxiety score was 14.29 ± 3.93 , with 69.2% of participants classified as having high or very high anxiety. Gender and educational level were not significantly associated with anxiety ($p=0.328$ and $p=0.804$, respectively) or information need ($p=0.408$ and $p=0.265$, respectively). Consultation was perceived to reduce anxiety by 98.0% of participants. Anxiety correlated significantly with systolic ($r=0.400$, $p=0.003$) and diastolic blood pressure ($r=0.473$, $p<0.001$), but not with heart rate, postoperative pain, or Aldrete recovery score. **Conclusion:** Preoperative anxiety was common and was associated with higher blood pressure, while significant gender- or education-related differences were not demonstrated. Individualized preoperative communication may support patient-centered perioperative care. **Keywords:** Preoperative Anxiety and Information Scale; preoperative anxiety; preoperative consultation; educational level; gender; blood pressure; elective surgery.

EDITORIAL INFORMATION

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Ethical Approval: Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan.

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INTRODUCTION

Preoperative anxiety is a common psychological response among patients awaiting surgery and remains an important component of perioperative care despite advances in anesthesia, surgical techniques, and postoperative management. Anxiety may arise from uncertainty regarding the surgical procedure, fear of anesthesia, anticipated postoperative pain, concerns about complications, and uncertainty regarding recovery. Evidence from low- and middle-income settings indicates that preoperative anxiety affects a substantial proportion of surgical patients and may be associated with physiological stress responses and less favorable perioperative experiences (1). The Amsterdam Preoperative Anxiety and Information Scale (APAIS) is commonly used to assess anxiety related to anesthesia and surgery as well as patients' need for perioperative information (2).

Effective communication before surgery is therefore an important aspect of patient-centered perioperative care. Preoperative consultation provides an opportunity for healthcare professionals to explain the planned anesthesia and surgical pathway, discuss anticipated risks and benefits, provide fasting and postoperative care instructions, address concerns, and allow patients to ask questions. Individualized preoperative education has been associated with lower anxiety and improved patient experiences in surgical populations, suggesting that appropriately delivered information may help patients approach surgery with greater understanding and confidence (3). Evidence specifically evaluating preoperative anesthesia consultation has similarly suggested a potential role in reducing anxiety among patients undergoing surgical procedures (4).

The effectiveness of preoperative communication may nevertheless vary according to individual patient characteristics. Gender has been associated with differences in the prevalence and expression of anxiety disorders, and some surgical studies have reported higher preoperative anxiety among female patients (5). However, such differences are not consistently demonstrated across surgical populations and may be influenced by the type of procedure, previous surgical experience, sociocultural factors, and other patient characteristics. Consequently, gender should be examined as a potential correlate of preoperative anxiety rather than assumed to determine the psychological response to surgery.

The ability to understand perioperative information may also influence patients' anxiety and information requirements. Health literacy has been associated with preoperative anxiety among patients undergoing elective surgery, particularly when patients experience difficulty understanding information concerning anesthesia, procedural risks, or perioperative instructions (6). In the present study, however, participants were classified according to their educational level rather than by a validated measure of health literacy. Educational attainment may influence how patients receive and interpret medical information, but it should not be considered equivalent to health literacy. Examining anxiety and information needs across educational groups may therefore help identify whether patients with different educational backgrounds experience the preoperative period differently and whether communication strategies should be adapted accordingly.

Preoperative anxiety may also have physiological and postoperative relevance. Psychological stress can activate autonomic responses that influence cardiovascular parameters, while previous research has examined associations between psychological factors and early surgical recovery (7). Contemporary evidence further emphasizes that perioperative anxiety should be considered not only as an emotional experience but also as a potentially relevant component of perioperative assessment and patient-centred care (8). Accordingly, evaluating anxiety alongside preoperative heart rate and blood pressure, postoperative pain, recovery status, complications, length of hospital stay, and patient satisfaction may provide a broader understanding of its clinical relevance.

Although preoperative anxiety and the potential benefits of patient education have been investigated internationally, evidence examining these relationships within local surgical populations remains limited. In particular, there is a need to understand whether anxiety and information requirements differ according to gender and educational level and how preoperative anxiety relates to perioperative physiological and recovery outcomes among patients receiving routine preoperative consultation in tertiary-care hospitals in Lahore. Such evidence may support more patient-centered communication while avoiding assumptions that all patients require the same type or amount of perioperative information.

Therefore, the objective of this study was to assess preoperative anxiety and information needs among adult elective surgical patients receiving preoperative consultation at two tertiary-care hospitals in Lahore, compare these measures according to gender and educational level, evaluate patients' perceived response to consultation, and examine the relationship between preoperative anxiety and selected physiological and postoperative outcomes.

MATERIALS AND METHODS

A comparative observational study was conducted from January to April 2025 at General Hospital Lahore and Social Security Hospital Lahore, Pakistan. A total of 52 adult patients scheduled for elective surgery were enrolled through purposive sampling, with equal representation of males and females (26

each). Patients aged 18–50 years with American Society of Anesthesiologists (ASA) physical status I–II were included. Patients undergoing emergency surgery, those with ASA status III or above, diagnosed psychiatric disorders, ongoing pharmacological or psychological treatment for anxiety, or unwillingness to participate were excluded.

Demographic and clinical information, including age, gender, educational level, occupation, previous surgical history, type of surgery, planned anesthesia, heart rate, and blood pressure, was recorded. Educational attainment was categorized as primary, secondary, higher secondary, or graduate level. All participants received routine preoperative consultation by an anesthesiologist covering the planned anesthesia technique, risks and benefits, fasting instructions, perioperative care, postoperative pain management, and expected recovery. Information was communicated in language appropriate to the participant's educational level, and patients were encouraged to discuss their concerns.

Preoperative anxiety and information requirements were assessed using the Amsterdam Preoperative Anxiety and Information Scale (APAIS). Participants also evaluated the perceived effect and usefulness of the consultation. Postoperative outcomes included pain assessed using the Visual Analogue Scale (VAS), recovery assessed using the Aldrete score, length of hospital stay, postoperative complications, and satisfaction with anesthesia care. Data were analyzed using IBM SPSS Statistics version 26.0. Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using mean and standard deviation where appropriate. The Mann–Whitney U test compared APAIS scores between genders, and the Kruskal–Wallis H test assessed differences across educational levels. Chi-square tests were used for categorical associations, while Pearson's correlation assessed relationships between APAIS anxiety scores and physiological and postoperative outcomes. All tests were two-tailed, with $p < 0.05$ considered statistically significant. Ethical approval was obtained from the Ethical Review Committee, Faculty of Allied Health Sciences, The University of Lahore (Ref. No.: DRC/DHPT022/06/24). Written informed consent was obtained from all participants, and the study was conducted in accordance with the Declaration of Helsinki.

RESULTS

A total of 52 patients undergoing elective surgery were included, with equal representation of females and males ($n=26$ each). The largest age group was 29–39 years (40.4%), followed by 18–28 years (34.6%) and 40–50 years (25.0%). Graduate education was reported by 34.6% of participants, while 28.8% had secondary, 21.2% primary, and 15.4% higher-secondary education. Most participants had no previous surgical history (65.4%), and major surgical procedures accounted for 61.5% of cases. General anesthesia was the most frequently planned technique (51.9%), followed by regional (34.6%) and local anesthesia (13.5%) (Table 1).

Table 1. Demographic and Clinical Characteristics of Participants

Characteristic	n (%)
Gender	
Female	26 (50.0)
Male	26 (50.0)
Age group, years	
18–28	18 (34.6)
29–39	21 (40.4)
40–50	13 (25.0)
Educational level	
Primary	11 (21.2)
Secondary	15 (28.8)
Higher secondary	8 (15.4)
Graduate	18 (34.6)
Occupation	
Unemployed	13 (25.0)
Student	8 (15.4)
Skilled labour	13 (25.0)
Professional	15 (28.8)

Characteristic	n (%)
Other	3 (5.8)
Previous surgery	
Yes	18 (34.6)
No	34 (65.4)
Surgery category	
Major	32 (61.5)
Minor	20 (38.5)
Planned anesthesia	
General	27 (51.9)
Regional	18 (34.6)
Local	7 (13.5)

Preoperative anxiety was common, with an overall APAIS anxiety score of 14.29 ± 3.93 . High anxiety scores were observed in 21 patients (40.4%) and very high scores in 15 (28.8%); therefore, 69.2% of the cohort was classified within the high or very-high anxiety categories. Only 11.5% had low anxiety. Information requirements were also substantial, with 30.8% demonstrating high and 23.1% very high information needs. Pain was the most frequently reported source of preoperative fear (46.2%), followed by lack of information (19.2%), concerns regarding surgical outcomes (17.3%), and anesthesia (11.5%) (Table 2).

Table 2. Preoperative Anxiety, Information Need and Principal Sources of Anxiety

Variable	n (%)
APAIS anxiety category	
Low (4–8)	6 (11.5)
Moderate (9–12)	10 (19.2)
High (13–16)	21 (40.4)
Very high (17–20)	15 (28.8)
APAIS information-need category	
Low (2–4)	8 (15.4)
Moderate (5–6)	16 (30.8)
High (7–8)	16 (30.8)
Very high (9–10)	12 (23.1)
Principal source of anxiety/fear	
Pain	24 (46.2)
Lack of information	10 (19.2)
Surgical outcome	9 (17.3)
Anesthesia	6 (11.5)
None	2 (3.8)
Multiple concerns	1 (1.9)

Overall APAIS anxiety score: 14.29 ± 3.93 .

Most preoperative consultations lasted 10–20 minutes (50.0%), while 44.2% lasted less than 10 minutes. Following consultation, 53.8% of participants perceived their anxiety as slightly reduced and 44.2% as significantly reduced, while only one participant (1.9%) reported no change. Consultation was rated as useful or very useful by 73.1% of participants, and all participants indicated that they would recommend preoperative consultation to others. These findings represent patient-perceived benefit and were not interpreted as an objectively measured pre–post change in APAIS score (Table 3).

Table 3. Preoperative Consultation and Postoperative Outcomes

Outcome	n (%)
Consultation duration	
<10 min	23 (44.2)
10–20 min	26 (50.0)
>20 min	3 (5.8)
Perceived effect on anxiety	

Outcome	n (%)
No change	1 (1.9)
Slightly reduced	28 (53.8)
Significantly reduced	23 (44.2)
Perceived usefulness	
Somewhat useful	14 (26.9)
Useful	27 (51.9)
Very useful	11 (21.2)
Postoperative pain	
Mild (VAS 1–3)	5 (9.6)
Moderate (VAS 4–6)	29 (55.8)
Severe (VAS 7–10)	18 (34.6)
Length of hospital stay	
1–2 days	18 (34.6)
3–4 days	27 (51.9)
5–7 days	7 (13.5)
Postoperative complications	
None	17 (32.7)
Minor	31 (59.6)
Major	4 (7.7)
Aldrete score	
6	1 (1.9)
7	2 (3.8)
8	16 (30.8)
9	25 (48.1)
10	8 (15.4)
Would recommend consultation	
Yes	52 (100.0)

Postoperatively, moderate pain was reported by 55.8% of participants and severe pain by 34.6%. Most patients remained hospitalized for 3–4 days (51.9%), while 34.6% stayed for 1–2 days. Minor postoperative complications were documented in 59.6%, major complications in 7.7%, and no complications in 32.7%. Recovery scores were generally favorable: 48.1% achieved an Aldrete score of 9 and 15.4% achieved a score of 10 (Table 3).

No statistically significant difference in APAIS anxiety was identified between female and male participants ($p=0.328$). Although females demonstrated a higher mean rank for information need than males (28.19 vs 24.81), this difference was also not statistically significant ($p=0.408$). Anxiety scores did not differ significantly across educational levels ($p=0.804$), nor did information-need scores ($p=0.265$) (Table 4). Accordingly, the present data do not establish independent gender- or education-related differences in preoperative anxiety or information requirements.

Table 4. APAIS Anxiety and Information-Need Scores According to Gender and Educational Level

Comparison	n	APAIS measure	Estimate
Anxiety by gender			
Female	26	Anxiety	—
Male	26	Anxiety	—
Information need by gender			
Female	26	Mean rank	28.19
Male	26	Mean rank	24.81
Anxiety by educational level			
Primary	11	Mean rank	29.14
Secondary	15	Mean rank	27.93
Higher secondary	8	Mean rank	23.31
Graduate	18	Mean rank	25.11
Information need by educational level			

Comparison	n	APAIS measure	Estimate
Primary	11	Mean $\pm$ SD	7.73 $\pm$ 1.68
Secondary	15	Mean $\pm$ SD	6.27 $\pm$ 1.67
Higher secondary	8	Mean $\pm$ SD	7.38 $\pm$ 2.62
Graduate	18	Mean $\pm$ SD	6.94 $\pm$ 2.51

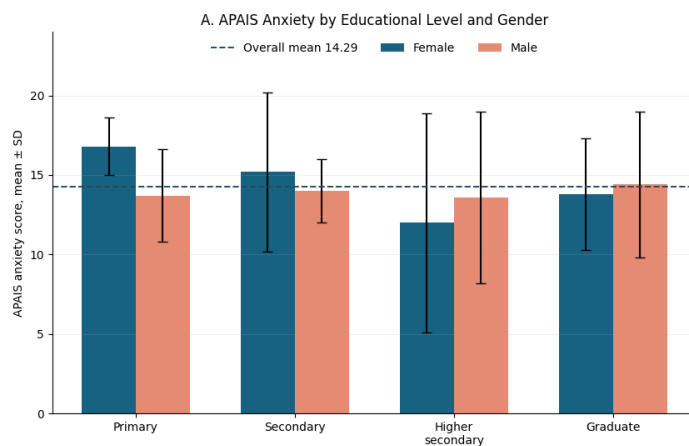
Exploratory stratification by gender and educational level showed that primary-educated females had the highest mean APAIS anxiety score (16.8 $\pm$ 1.8), followed by secondary-educated females (15.2 $\pm$ 5.0). Among males, mean scores ranged from 13.6 $\pm$ 5.4 in the higher-secondary group to 14.4 $\pm$ 4.6 among graduates. Given the small subgroup sizes and the absence of significant overall differences according to gender or educational level, these findings were considered descriptive patterns rather than evidence of a subgroup effect illustrated in Table 5 and figure 1.

Table 5. APAIS Anxiety Scores Stratified by Educational Level and Gender

Educational level	Female, mean $\pm$ SD (n)	Male, mean $\pm$ SD (n)
Primary	16.8 $\pm$ 1.8 (5)	13.7 $\pm$ 2.9 (6)
Secondary	15.2 $\pm$ 5.0 (8)	14.0 $\pm$ 2.0 (7)
Higher secondary	12.0 $\pm$ 6.9 (3)	13.6 $\pm$ 5.4 (5)
Graduate	13.8 $\pm$ 3.5 (10)	14.4 $\pm$ 4.6 (8)

Overall APAIS anxiety score: 14.29 $\pm$ 3.93 (N=52).

Figure 1. APAIS Anxiety Scores Stratified by Educational Level and Gender



APAIS anxiety scores demonstrated a **moderate positive correlation with preoperative systolic blood pressure** ($r=0.400$, $p=0.003$) and a somewhat stronger positive correlation with **diastolic blood pressure** ($r=0.473$, $p<0.001$). In contrast, anxiety was not significantly associated with heart rate ($r=0.215$, $p=0.126$), postoperative pain ($r=0.146$, $p=0.302$), or Aldrete recovery score ($r=-0.157$, $p=0.266$) (Table 6). Thus, higher anxiety was associated primarily with higher preoperative blood pressure rather than with the measured early postoperative recovery or pain outcomes.

Table 6. Correlation of APAIS Anxiety Score with Physiological and Postoperative Outcomes

Outcome	Pearson's r	p-value
Preoperative heart rate	0.215	0.126
Preoperative systolic BP	0.400	0.003
Preoperative diastolic BP	0.473	<0.001
Aldrete recovery score	-0.157	0.266
Postoperative pain (VAS)	0.146	0.302

BP, blood pressure; VAS, Visual Analogue Scale. Statistical significance was defined as $p<0.05$.

DISCUSSION

The present study demonstrates that preoperative anxiety was common among elective surgical patients, with more than two-thirds of participants falling within the high or very-high APAIS anxiety categories. Although some descriptive variation was observed according to gender and educational level, neither factor showed a statistically significant association with anxiety. Patients generally perceived preoperative consultation favourably, while higher anxiety scores were significantly associated with increased preoperative systolic and diastolic blood pressure. These findings suggest that anxiety remains clinically relevant in the perioperative period, while demographic subgroup differences should be interpreted cautiously.

The high burden of anxiety observed in this study is consistent with previous reports showing that anxiety is frequent among adults awaiting elective surgery. Aust et al. identified preoperative anxiety as an important concern in adult surgical populations, while Jafar et al. similarly reported a substantial burden of preoperative anxiety among Pakistani surgical patients (9,10). Differences in prevalence between studies may reflect variations in surgical procedures, patient characteristics, healthcare settings, and anxiety-assessment methods. Nevertheless, the present findings reinforce the importance of identifying anxiety during routine preoperative assessment.

Female participants showed descriptively higher anxiety in some educational subgroups, particularly among those with primary education; however, the overall gender comparison was not statistically significant. Previous studies have frequently identified female sex as a correlate of greater preoperative anxiety, including observational studies of elective surgical and obstetric-gynaecological populations (11,12). The absence of a significant gender difference in the present study may reflect the relatively small sample and heterogeneity of surgical procedures. Importantly, these findings indicate that anxiety screening should not be restricted according to gender because clinically relevant anxiety may occur in both male and female patients.

Educational level was likewise not significantly associated with either APAIS anxiety or information-need scores. Although primary-educated females had the highest descriptive mean anxiety score, the small subgroup sizes limit interpretation of this pattern. Previous research has suggested that educational attainment, awareness of surgical procedures, and access to understandable perioperative information may influence preoperative anxiety (13). However, educational attainment should not be considered equivalent to health literacy. The current findings therefore support individualized communication based on patients' understanding and information requirements rather than assuming anxiety from educational status alone.

An important finding was the favourable patient perception of preoperative consultation. Almost all participants reported some reduction in anxiety following consultation, and all indicated that they would recommend consultation to others. Previous studies have similarly shown that structured preoperative dialogue and education may improve anxiety, satisfaction, and the overall perioperative experience (14,15). However, the present findings represent patients' perceived response to consultation rather than a demonstrated pre–post change in APAIS scores. They therefore support the acceptability and perceived usefulness of consultation but should not be interpreted as definitive evidence of its causal effectiveness.

Higher APAIS anxiety scores were moderately associated with both systolic ($r=0.400$, $p=0.003$) and diastolic blood pressure ($r=0.473$, $p<0.001$). Anxiety can activate sympathetic and neuroendocrine stress responses, providing a plausible explanation for elevations in cardiovascular parameters during the preoperative period. Previous literature has similarly linked perioperative anxiety with physiological responses and postoperative outcomes (16). In contrast, anxiety was not significantly correlated with heart rate, postoperative pain, or Aldrete recovery score in the present sample. These findings suggest that the measurable physiological relationship was more evident for preoperative blood pressure than for the assessed early postoperative outcomes.

From a clinical perspective, the findings support incorporating brief anxiety assessment and patient-centred communication into routine preoperative care. Patients' concerns should be addressed according to their individual information needs rather than solely according to gender or educational

background. This may be particularly relevant in busy surgical settings where a focused consultation can provide an opportunity to clarify anesthesia plans, expected recovery, pain management, and patient concerns without requiring extensive additional resources.

The study has several strengths, including equal representation of male and female participants, use of the APAIS instrument, assessment of both psychological and physiological variables, and inclusion of patients from two tertiary-care hospitals. However, the relatively small sample, purposive sampling, heterogeneous surgical and anesthesia categories, and recruitment from only two hospitals limit generalizability. Small gender-by-education subgroups reduced the ability to detect subgroup differences, while the observational design precludes causal inference. Educational attainment was assessed rather than health literacy using a validated instrument, and the perceived effect of consultation was self-reported. Larger prospective studies incorporating validated health-literacy assessment and objectively measured pre–post anxiety scores would provide stronger evidence regarding which patients benefit most from structured preoperative consultation.

CONCLUSION

Preoperative anxiety was common among elective surgical patients, with a substantial proportion experiencing high or very high anxiety. Although anxiety and information needs showed some variation across gender and educational groups, these differences were not statistically significant. Preoperative consultation was perceived positively by most participants and was associated with high patient satisfaction and perceived anxiety reduction. Higher anxiety scores were significantly correlated with increased systolic and diastolic blood pressure but were not significantly associated with heart rate, postoperative pain, or early recovery scores. These findings support routine assessment of preoperative anxiety and individualized patient-centered communication as components of perioperative care, irrespective of gender or educational background.

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