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Prevalence and Predictors of Anesthesia-Related Anxiety and Fear in Surgical Patients: A Cross-Sectional Study in Zahedan, Iran

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ABSTRACT

Introduction: Preoperative anxiety and fear of anesthesia are significant psychological burdens for surgical patients, yet their demographic predictors remain understudied in Middle Eastern populations. This study examined the prevalence and correlates of these stressors among first-time surgical patients in Iran.

Methods: In this cross-sectional study, 100 patients scheduled for first-time surgery at two Zahedan hospitals (2021–2022) completed validated questionnaires assessing anxiety and anesthesia-related fear. Data were analyzed using descriptive statistics, independent t-tests, and regression analyses.

Results: The study revealed that 74% of participants experienced clinically significant preoperative anxiety (mean score: 13.21 ± 9.04), with elevated fears related to procedural pain (1.64 ± 1.06), anesthesia needles (1.09 ± 1.16), and potential ICU admission (1.47 ± 1.37). Notably, patients with intermediate education levels (high school/diploma) exhibited significantly higher anxiety ($p = 0.019$) and fear ($p < 0.001$) compared to both less-educated and more-educated counterparts. While no significant associations were found with age, gender, or marital status ($p > 0.05$), a strong positive correlation was observed between general anxiety and anesthesia-specific fear ($r = 0.422$, $p < 0.001$).

Conclusion: These findings highlight the high prevalence of preoperative psychological distress, particularly among patients with intermediate health literacy. The results underscore the need for tailored preoperative education programs targeting vulnerable subgroups to improve surgical experiences and outcomes.

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Introduction

Preoperative anxiety represents a significant psychological challenge for surgical patients, characterized by feelings of helplessness and distress in anticipation of anesthesia and surgery (1). This phenomenon affects 55–80% of patients globally and manifests through both psychological distress and physiological changes, including elevated blood pressure, tachycardia, and increased postoperative analgesic requirements (2,3). The anxiety stems from multiple sources: fear of the unknown, potential pain, loss of control during anesthesia, and concerns about surgical outcomes (4,5).

The psychological underpinnings of anesthesia-related anxiety are complex. Theoretical frameworks ranging from Freud's concept of "objective anxiety" to cognitive-behavioral models emphasize the role of perceived loss of control and inadequate preoperative information (6,7). In Iran's healthcare system, where preoperative anesthesia consultations are typically limited to brief 3–5-minute encounters, these psychological factors are exacerbated by systemic challenges (8). It has been suggested that 46.9% of surgical patients experience clinically significant anxiety, with particularly high prevalence among women, younger patients, and those with lower educational attainment (9,10).

This anxiety carries significant clinical consequences. Beyond the immediate distress, it is associated with poorer surgical outcomes, including delayed recovery, increased postoperative pain medication requirements, and prolonged hospital stays (11,12). While non-pharmacological interventions like structured preoperative education have demonstrated

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efficacy in reducing anxiety by 22–58%, these approaches remain underutilized in Iranian clinical practice due to resource constraints and time limitations (13,14).

This study investigates anesthesia-related anxiety among patients at Imam Ali and Khatam Hospitals (2021–2022) to address critical gaps in perioperative care. We pursue three interconnected objectives: (1) quantifying preoperative anxiety prevalence, (2) identifying demographic and clinical predictors of anxiety severity, and (3) formulating evidence-based strategies for integrating anxiety management into routine preoperative workflows. By systematically examining these dimensions, our research seeks to improve surgical outcomes while advancing patient-centered care standards in resource-constrained settings. The findings will offer actionable insights for healthcare systems facing comparable challenges in preoperative preparation, bridging the divide between global best practices and local implementation realities.

Materials and Method

This descriptive-analytical, cross-sectional study was conducted to evaluate preoperative anxiety and fear related to anesthesia among patients scheduled for surgery at Imam Ali and Khatam Hospitals in Zahedan during 2021–2022. The study population consisted of adult patients (aged 18–70 years) referred to the surgical clinics or admitted to the operating rooms of these hospitals. Patients with a history of severe psychiatric disorders or those unable to complete the questionnaire due to cognitive or language barriers were excluded. A total of 100 participants were enrolled through non-random purposive sampling to ensure representation of diverse demographic and clinical profiles.

Data collection was performed in two phases to capture dynamic changes in anxiety levels. In the first phase, participants completed a structured questionnaire on the evening before their scheduled surgery. This questionnaire gathered demographic information (age, gender, education level, occupation, marital status, and number of children) and clinical characteristics (vital signs, previous surgical experiences). Anxiety levels were assessed using the validated Amsterdam Preoperative Anxiety and Information Scale (APAIS), which quantifies anxiety through a series of Likert-scale items. Physiological markers of stress, including blood pressure, heart rate, and respiratory rate, were recorded simultaneously by trained nursing staff. The second phase occurred on the morning of surgery, immediately prior to transfer to the operating room, where the same questionnaire and physiological measurements were repeated to evaluate preoperative changes.

Ethical approval for this study was obtained from the Institutional Review Board of Zahedan University of Medical Sciences. All participants provided written informed consent after receiving a detailed explanation of the study's purpose and procedures. Confidentiality was maintained by anonymizing data and restricting access to the research team.

Statistical analysis was performed using SPSS software (version 26). Descriptive statistics (means, standard deviations, and percentages) summarized demographic and clinical variables. Inferential analyses included paired t-tests to compare anxiety scores between the two phases, chi-square tests to examine associations between categorical variables (e.g., gender and anxiety severity), and linear regression to identify predictors of high anxiety (e.g., age, preoperative vital signs). A p-value of <0.05 was considered statistically significant. Operational definitions were standardized to ensure consistency: anxiety was categorized as mild (APAIS scores 0–10), moderate (11–20), or severe (21–40), while fear of anesthesia was assessed through direct questions about perceived loss of control or complications. This two-phase design allowed for the identification of temporal trends and modifiable factors influencing preoperative anxiety, aligning with similar methodologies used in prior studies (15).

Results

This study evaluated preoperative anxiety and fear of anesthesia among 100 patients undergoing their first surgical procedure at Imam Ali and Khatam Hospitals in Zahedan during 2021-2022. The cohort comprised 57 males (57%) and 43 females (43%), with an age range of 19 to 62 years (mean = 35.26 ± 9.04 years). Demographic analysis revealed that the majority of participants held university degrees (60%), while smaller proportions had diplomas (24%), high school education (8%), primary/middle school education (6%), or were illiterate (2%). The sample included slightly more employed individuals (52%) than unemployed (48%), and a majority were married (55%) with an average of 1.35 ± 1.80 children.

Assessment of preoperative anxiety levels using standardized measures yielded a mean score of 13.21 ± 9.04 (possible range: 0-40). Stratification by severity showed that 40% of patients experienced moderate anxiety, while 34%

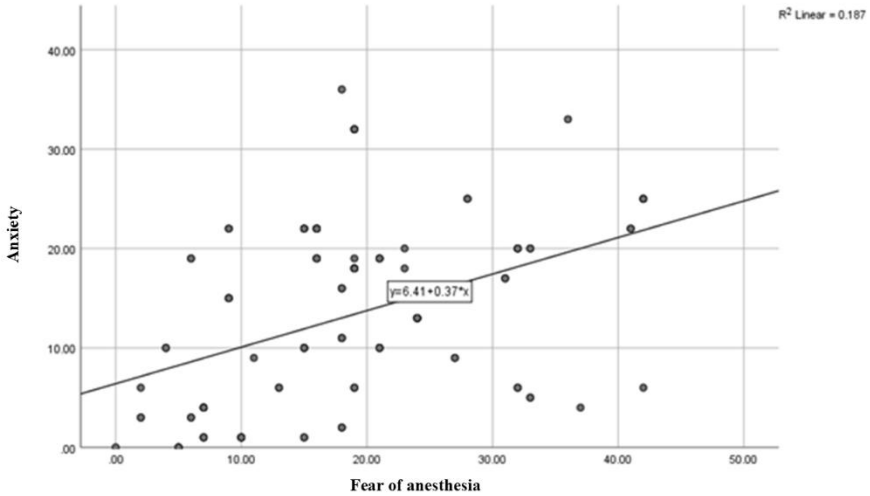
reported severe anxiety symptoms. Notably, 21% of participants demonstrated no significant anxiety, and only 5% exhibited mild symptoms. The most prominent anxiety triggers included existential concerns about mortality (mean score = 1.08 ± 0.9), fears of losing autonomy during the procedure (0.81 ± 0.8), and anticipatory gastrointestinal discomfort (0.75 ± 0.9).

Evaluation of anesthesia-related fears revealed a mean score of 18.51 ± 10.62, with particular concerns clustered around three main areas: anticipated pain during or after the procedure (highest fear score = 1.64 ± 1.06), apprehension about the anesthesia needle (1.09 ± 1.16), and distress regarding potential ICU admission (1.47 ± 1.37). These findings suggest that patients' fears tend to focus on concrete procedural elements rather than abstract medical concepts.

Statistical analysis of demographic correlations yielded several significant associations. Educational attainment emerged as a particularly strong predictor, with high school and diploma holders demonstrating significantly higher levels of both anxiety ($p = 0.019$) and fear ($p < 0.001$) compared to other educational groups. Employment status also showed a meaningful relationship with fear of anesthesia ($p = 0.005$), though its association with general anxiety fell just short of statistical significance ($p = 0.118$). Interestingly, no significant correlations were found between psychological distress measures and age, gender, marital status, or number of children (all $p > 0.05$).

The relationship between anxiety and anesthesia fear proved particularly robust, with correlation analysis revealing a strong positive association ($r = 0.422$, $p < 0.001$). Regression modeling indicated that fear of anesthesia accounted for approximately 18.7% of the variance in general anxiety scores ($R^2 = 0.187$), suggesting these constructs are related but distinct dimensions of preoperative psychological distress. This relationship is visually represented in Figure 1.

Figure 1. Relationship between anxiety and fear of anesthesia in study participants. The scatter plot displays individual data points with anxiety scores on the x-axis and fear of anesthesia scores on the y-axis. The regression line (solid) with 95% confidence intervals (shaded area) demonstrates the positive correlation ($r = 0.422$) between variables. The equation $y = 0.45x + 12.3$ describes the linear relationship, indicating that higher anxiety scores predict greater anesthesia fear, while acknowledging these remain distinct psychological constructs.



Discussion

The results of this study underscore the significant psychological distress experienced by surgical patients, particularly those undergoing their first surgical procedures. The high prevalence of preoperative anxiety and anesthesia-related fear highlights the crucial need for targeted psychological interventions to enhance the overall patient experience and improve surgical outcomes.

Our findings suggest that preoperative anxiety is not merely a transient response but a deeply embedded psychological challenge for many patients, particularly in the context of surgery, a highly invasive and anxiety-inducing medical event.

A striking finding from this study is that 75% of patients exhibited clinically significant levels of

anxiety, with 34% reporting severe symptoms. This finding is consistent with previous research, such as that by Kain et al. (2006), which reported that a substantial proportion of surgical patients experience high levels of anxiety prior to surgery (16). The elevated anxiety levels in our cohort are likely due to the inherent stress of anticipating bodily harm and the loss of personal autonomy, which can be especially pronounced in first-time surgical patients. This mirrors earlier work by Mobbs (2007), who theorized that surgery poses a threat to both the body and the self, triggering significant psychological stress (17).

One of the most notable findings in our study is the strong correlation between educational attainment and both anxiety and fear of anesthesia. Patients with a high school or diploma-level education demonstrated significantly higher levels of anxiety and fear compared to those with higher education or no formal education. This paradoxical relationship between health literacy and psychological distress is a key observation in this study and warrants further exploration. This pattern aligns with the "health literacy paradox" proposed by previous studies which suggests that individuals with moderate health literacy may experience higher anxiety due to their ability to comprehend risks but lack sufficient knowledge to properly contextualize them (18-19). While those with higher education may have a more detailed understanding of the surgical process and potential risks, individuals with intermediate education may struggle to manage their fears, as they can better grasp the potential dangers but lack the tools to mitigate anxiety effectively. Scherrer et al. (2019) similarly observed that patients with moderate health literacy were more likely to experience health-related anxiety compared to both low and high literacy groups (20).

Interestingly, the relationship between educational status and anxiety in our study contrasts with some Western research, which often finds higher levels of anxiety among more educated patients. However, this discrepancy could be attributed to cultural differences in perceptions of health and surgery, where individuals in certain contexts may have different coping mechanisms or sources of support. In the Iranian context, there may be different levels of public awareness and access to preoperative counseling, potentially influencing how educated patients perceive the risks associated with surgery.

The fear of anesthesia was a predominant concern for patients, with fears of pain during or after the procedure (mean score: 1.64 ± 1.06) and apprehension about the anesthesia needle (mean score: 1.09 ± 1.16) ranking as the most significant sources of anxiety. These findings resonate with previous studies, such as Kain et al. (2000), who identified fear of pain as the most common concern among surgical patients (21). This suggests that despite advances in anesthesia techniques, the fear of pain remains a central issue for patients, which can be exacerbated by a lack of understanding of the anesthesia process. Our study found that fears were often focused on tangible, concrete aspects of the surgical procedure (e.g., pain, needle phobia, ICU admission) rather than abstract medical risks such as anesthesia-related complications. This aligns with findings by Andersson et al. (2020), who noted that surgical patients often prioritize procedural aspects that are visually or physically present in their experience, such as the anesthesia needle, over less visible risks (22). This pattern emphasizes the importance of focusing preoperative education on procedural elements, especially through the use of visual aids, hands-on demonstrations, and detailed explanations, as recommended by guidelines such as the Enhanced Recovery After Surgery (ERAS) protocols (23-24).

The correlation between employment status and fear of anesthesia ($p=0.005$) found in this study also warrants discussion. Employed individuals expressed greater anxiety, likely due to concerns about postoperative recovery affecting their work responsibilities and financial stability. This is consistent with findings from DiGiovanni et al. (2003), who reported that patients' fears regarding recovery time and return to work were significant predictors of preoperative anxiety (25). The fear of losing income or facing employment difficulties during recovery may contribute to heightened stress, particularly in individuals who cannot afford to take extended time off work (26-27). While employment status was linked to fear of anesthesia, it did not significantly correlate with overall levels of anxiety ($p=0.118$). This may suggest that anesthesia-related fears are more focused on immediate, procedural aspects of the surgery, while general anxiety encompasses a broader set of concerns, including personal, familial, and existential issues. Therefore, a multifaceted approach to preoperative counseling should address both procedural fears (e.g., pain, anesthesia) and the broader anxieties related to surgery (e.g., life disruption, health risks) (28-29).

The strong positive correlation ($r=0.422$, $p<0.001$) between general anxiety and anesthesia-specific fear underscores the interrelated nature of these psychological constructs. While anxiety and fear

are distinct, our findings suggest they co-occur and likely exacerbate each other in the preoperative period. This correlation is in line with Kain et al. (2006), who found that high levels of preoperative anxiety significantly predicted greater anxiety during the anesthesia induction phase, which in turn could negatively affect postoperative outcomes such as pain management, recovery time, and overall patient satisfaction (30). Regression modeling in our study revealed that fear of anesthesia accounted for approximately 18.7% of the variance in general anxiety scores (R^2=0.187). This suggests that while anesthesia-related fear is a significant contributor to overall preoperative anxiety, other factors such as personal health history, previous experiences with healthcare, and personality traits may also play crucial roles in shaping patients' anxiety levels (31). Future studies could explore these other psychological and contextual variables to develop more tailored interventions for high-risk patients.

Several limitations temper our conclusions. The cross-sectional design prevents causal inferences about anxiety development. Our exclusion of emergency cases means we may have missed the most severely anxious patients. The single-center nature limits generalizability. Future research should employ longitudinal designs to track anxiety trajectories and include physiological measures like cortisol levels to complement self-report data.

Conclusion

This study highlights the significant role of preoperative anxiety and fear of anesthesia, with 74% of patients reporting moderate-to-severe distress. Key concerns include pain, anesthesia procedures, and ICU admission, with education level acting as a crucial factor. The correlation between anxiety and fear (r = 0.422) emphasizes the need for targeted interventions. The findings advocate for preoperative education and screening protocols, especially for those with intermediate health literacy, to identify and support high-anxiety patients. Integrating psychological preparation into surgical care can improve patient experiences and outcomes, aligning with guidelines from the American Society of Anesthesiologists and the ERAS Society. Future research should focus on anxiety trajectories and procedure-specific interventions.

Declarations

Ethics approval and consent to participate

This study was approved by the Ethics Committee of Zahedan University of Medical Sciences (IR.ZAUMS.REC.1404.044).

Consent for publication

Consent for publication was obtained from all included individuals.

Availability of data and materials

The original data used in the study are all included in the article, further inquiries can be directed to the corresponding author.

Competing interests

There is no conflict of interest.

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Authors' contributions

Writing original draft: Asadollah Shakeri, Nazli Farnoosh, Aidin Shakeri, and Mohammadreza sabouri

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Declaration of Conflicting Interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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