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EFFECT OF PREOPERATIVE ANESTHETIC EDUCATION ON PATIENT ANXIETY: A COMPARISON BETWEEN MAJOR AND MINOR SURGICAL PATIENTS

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Abstract

ABSTRACT

Background:

Preoperative anxiety is a regular challenge for surgical patients, driven by fear of the unknown, risks associated with anesthesia, postoperative discomfort, and unfamiliar clinical enviroment. Elevated blood pressure and heart rate are among the negative physiological reactions brought on by high baseline anxiety, which can compromise intraoperative stability and raise the need for anesthesia. Although preoperative education is a well-known non-pharmacological strategy for reducing this stress, little is known about how surgical complexity affects its efficacy, there is limited comparative data on how surgical complexity influences its effectiveness.

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Objective: The purpose of this study was to assess and compare how structured verbal preoperative anesthetic education affected the anxiety levels of individuals undergoing major and minor elective procedures.

Methodology:

A quasi-experimental comparative study was conducted at the Hayatabad Medical Complex and the Peshawar Institute of Medical Sciences, involving a stratified random sample of 96 adult patients (n = 48 minor surgery; n = 48 major surgery). Baseline anxiety was measured using a structured 8-item tool, followed by a face-to-face verbal educational session covering anesthetic procedures, risks, and postoperative care, after which anxiety was reassessed. Data were analyzed using paired and independent samples t-tests via SPSS version 25.

Results:

Across the entire study, structured education led to a highly statistically significant reduction in mean anxiety scores from a baseline of 1.89 down to 1.23 ($t = 10.213$, $p < 0.001$), with high-anxiety cases dropping from 25.0% to 3.1%. At baseline, major surgery patients exhibited significantly higher anxiety of mean 2.27 than minor surgery patients (mean=1.50, $p = 0.001$). Post-intervention, while anxiety decreased significantly in both groups, the major surgery group maintained a significantly higher residual anxiety mean 1.33 compared to the minor surgery group (mean=1.12, $p = 0.037$).

Conclusion:

Structured verbal preoperative anesthetic education is a highly effective, accessible, and clinically adaptable strategy for mitigating preoperative anxiety, successfully bridging communication barriers even for patients without formal education. However, Patients after major surgery continue to experience higher levels of anxiety, highlighting the urgent need for more thorough, specific psychological counseling templates in high-complexity cases.

INTRODUCTION

Preoperative anxiety is common in patients awaiting surgery and has a significant impact on perioperative outcomes. Anxiety before surgery is influenced by a number of factors, including fear of anesthesia, postoperative discomfort, surgical issues, and the unfamiliar hospital environment. According to studies, a sizable portion of surgical patients suffer from moderate to severe preoperative anxiety, which could compromise recovery and physiological stability (Shebl *et al.*, 2015). High levels of anxiety have been associated with increase in the blood pressure, heart rate, and the need for more anesthetics and analgesics, which can delay recovery and low patient satisfaction (Tadesse *et al.*, 2022). Additionally, anxiety might worsen postoperative

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pain perception and decrease patient cooperation during anesthetic induction (Baagil *et al.*, 2023).

Numerous factors, including age, sex, education level, previous surgical experience, and cultural background, have an impact on preoperative anxiety. Due to their fear of the unknown, younger patients and those who have never had surgery before frequently report higher anxiety levels, while older or more seasoned patients may feel less anxious and better prepared (Samadi,2024). Additionally, differences between genders are noted, with women frequently feeling more anxious before surgery than males (Surme & Cimen, 2022). Patients scheduled for big or high-risk surgeries usually report higher levels of anxiety than those undergoing lesser operations, therefore the kind and complexity of surgery have a crucial influence (Kkassahun *et al.*, 2022).

Knowing about these variables is crucial for optimizing perioperative treatment and identifying individuals who are more likely to experience anxiety. One of the most researched non-pharmacological methods for reducing preoperative anxiety is patient education. By educating patients on the surgical process, anesthesia, anticipated feelings, and postoperative care, preoperative education helps patients feel more psychologically prepared and less afraid of the unknown situations (Chen *et al.*, 2025). Patients who participate in structured education programs feel more in charge and believe they are more prepared for surgery (Jamwal *et al.*, 2023). Research suggests that preoperative education, as compared to standard care, can considerably lower anxiety. Patients undergoing elective surgery who received thorough preoperative teaching scored lower on anxiety scales than those who received usual information (Wang *et al.*, 2022). Providing audiovisual teaching materials before to surgery can lower anxiety and increase patient satisfaction (Kulakac & Ustuner Top, 2025).Preoperative anxiety has been demonstrated to be effectively reduced by individualized counseling, which includes descriptions of surgical procedures, anesthetic expectations, and postoperative pain management (Mondanloo *et al.*, 2023).

Not all studies demonstrate a significant reduction in anxiety following preoperative education, despite numerous encouraging findings. This could be due to the fact that educational programs vary in their level of clarity or information. Patients' comprehension of the information may be impacted by the mode of delivery, including written materials, films, or spoken explanations. Results are also influenced by individual patient characteristics such as age, educational attainment, and prior surgical experience. Furthermore, compared to patients undergoing lesser procedures, who often have lower anxiety levels, patients facing major

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surgery frequently suffer higher levels of worry and may benefit more from thorough education. Therefore, in order to feel comforted, certain patients might require more individualized teaching. As a result, not all patients benefit equally from preoperative education (Charette, 2021).

Although preoperative education has great promise, thorough evaluations indicate that standardized procedures are required to guarantee consistent effects across various patient populations and surgical situations. Clear and consistent methods can reduce variances, enhance patient comprehension, minimize anxiety, and lead to better perioperative care and results (Ji *et al.*, 2022).Effective preoperative education may also greatly enhance postoperative results. Higher patient satisfaction, shorter hospital stays, and lower complication rates have all been linked to improved educational interventions. Patients who are well-informed tend to recover more quickly and have better overall surgical outcomes because they have lower levels of postoperative pain, need fewer analgesics, and follow postoperative instructions more closely (Ataro *et al.*, 2024).

In low-resource countries, where many patients have little access to trustworthy surgical information and frequently suffer from high levels of anxiety and misinformation, structured preoperative education is particularly helpful. Clear, uncomplicated, and culturally relevant instruction can increase comprehension, lessen anxiety, promote patient participation, and ultimately result in improved surgical results and recovery(Ullah *et al.*, 2024). For example, preoperative education sessions significantly lowered anxiety scores among patients undergoing general anesthesia, according to research done in a specialized referral hospital in Pakistan (Slik & Khalid, 2022).

Despite existing evidence on preoperative anesthetic education and anxiety reduction, there is a lack of comparative evidence directly evaluating its effect between patients undergoing major and minor surgeries.This suggests an apparent absence of knowledge regarding how surgical complexity affects how well educational programs work to lower preoperative anxiety. Preoperative education may have an impact on patients undergoing various types of surgery since they frequently have distinct levels of fear, knowledge demands, and emotional reactions. To enhance patient treatment, it is crucial to investigate these variations in greater detail. This gap has to be filled in order to create more efficient and tailored anesthetic education programs based on surgical risk level. In both major and minor surgical populations, such customized interventions may improve anxiety management, raise patient

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readiness, foster improved collaboration during anesthesia, and ultimately result in better perioperative outcomes.

RESEARCH METHODOLOGY

1) STUDY DESIGN

A Quasi-experimental comparative study was used to assess the level of preoperative anxiety among patients undergoing elective surgical procedures.

2) STUDY SETTING

The study was conducted in the surgical wards of a Hayatabad Medical Complex Peshawar And Peshawar Institute of Medical Sciences.

3) STUDY POPULATION

The study population was included adult patients admitted for elective surgical procedures.

4) SAMPLE SIZE

The sample size for this study was calculated using the standard formula for prevalence estimation:

Where n represents the required sample size, Z is the standard normal deviate at a 95% confidence level (1.96), p is the estimated prevalence of preoperative anxiety (0.62) and d is the margin of error (0.10).

$$n = \frac{Z^2 \times p(1-p)}{d^2}$$

Based on this formula, the calculated sample size was 96. The total sample was equally divided into two groups, with 48 patients undergoing major surgical procedures and 48 patients undergoing minor surgical procedures.

5) SAMPLING TECHNIQUE

Patients undergoing elective major and minor surgeries at Hayatabad Medical Complex Peshawar and Peshawar Institute of Medical Sciences was included. Adults (≥18 years) able to understand the anesthetic education and give consent were eligible; emergency surgeries and cognitively impaired patients was excluded.

Stratified random sampling were used, dividing patients into major and minor surgery groups. Participants from each group were randomly selected proportionally to ensure fair representation. This method allows reliable comparison of the effect of preoperative anesthetic education on patient anxiety between the two groups.

6) INCLUSION CRITERIA

- Adult patients aged 18 years and above.

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- Patients scheduled for elective surgery.
- Patients willing to participate in the study.
- Psychologically stable patients who are able to understand and respond to study questions.

7) EXCLUSION CRITERIA

- Patients who refuse to participate or do not provide informed consent.
- Patients younger than 18 years of age.
- Emergency surgical patients.
- Patients with diagnosed psychiatric disorders

8) DATA COLLECTION TOOLS

Data was collected using a structured questionnaire. The tools were include:

1. **Informed Consent Form (Appendix A):** A written informed consent form was used to obtain voluntary participation from each patient prior to data collection.
2. **Demographic Information (Appendix B):** Age, gender, type of surgery (major or minor), and relevant medical history.
3. **Anxiety Assessment Tool (Appendix C):** Patient anxiety was measured before and after the educational session using a structured anxiety assessment tool consisting of eight items were used to assess preoperative anxiety levels among patients undergoing major and minor surgeries.

9) DATA COLLECTION PROCEDURE

Data were collected using a structured questionnaire. Baseline anxiety levels were assessed before the educational intervention using a standardized anxiety assessment tool. Patients then received preoperative anesthetic education regarding anesthesia procedures, benefits, risks, and postoperative care. Post -education nxiety levels were reassessed after the educational session.

10) ETHICAL CONSIDERATIONS

Ethical approvals were obtained from the Hayatabad Medical Complex Peshawar and Peshawar Institute of Medical Sciences. Written informed consents were obtained from all participants. Confidentiality and anonymity of participants were maintained throughout the study.

11) DATA ANALYSIS PLAN

Data was entered, cleaned, and analyzed using Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics were used to summarize participants' demographic characteristics and study variables. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were calculated for continuous variables.

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Anxiety levels before and after preoperative anesthetic education were assessed using mean anxiety scores. Paired sample t-test was used to compare pre-education and post-education anxiety scores within the same group. Independent sample t-test was used to compare anxiety scores between patients undergoing major and minor surgeries.

Results were presented in the form of tables and charts. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Demographic Characteristics of Participants

The study evaluated a total sample of 96 surgical patients. Demographic variables included age, gender, education level, and the type of surgery scheduled.

Table 4.1 Age of the Participants

Age group	Frequency	Percentage(%)
18-30	23	24.0%
31-40	33	34.4%
41-50	17	17.7%
51-60	17	17.7%
Above 60	6	6.3%
Total	96	100%

The mean age of the study population was 38.35 ±13.16 years, spanning a wide distribution from a minimum of 18 years to a maximum of 67 years. The largest age cohort fell within the 31–40 years range (34.4%).

Gender Distribution

Table 4.2 Gender Distribution of Participants

Gender	Frequency	Percentage(%)
Male	56	58.3%
Female	40	41.7%
Total	96	100%

Gender distribution showed a male majority, with 56 male participants (58.3%) and 40 female participants (41.7%).

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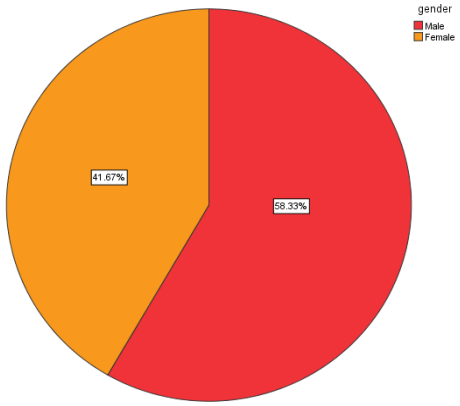

Figure 1: Gender Distribution of Participants

Education level

Table 4.3 Educational Level of Participants

Education level	Frequency	Percentage(%)
No education	34	35.4%
Primary	23	24.0%
Secondary	18	18.8%
Intermediate	16	16.7%
Graduate or above	5	5.2%
Total	96	100%

Regarding educational status, 34 (35.4%) participants had no formal education, 23 (24.0%) had primary education, 18 (18.8%) had secondary education, 16 (16.7%) had intermediate education, and 5 (5.2%) were graduates or above. The largest proportion of participants had no formal education.

Type of Surgery

Table 4.4 Type of Surgery

Statement	Frequency	Percentage(%)
Minor Surgery	48	50%
Major Surgery	48	50%
Total	96	100%

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Among the participants, 48 (50.0%) underwent minor surgery and 48 (50.0%) underwent major surgery. Thus, both groups were equally represented in the study.

4.2 Impact of Preoperative Anesthetic Education on Anxiety

Anxiety Levels Before Preoperative Anesthetic Education

Table 4.5 Anxiety Levels Before Education

Statement	Frequency	Percentage(%)
Low anxiety	35	36.5%
Moderate anxiety	37	38.5%
High anxiety	24	25.0%
Total	96	100%

Before receiving preoperative anesthetic education, 35 (36.5%) participants had low anxiety, 37 (38.5%) had moderate anxiety, and 24 (25.0%) had high anxiety. Moderate anxiety was the most common anxiety level before education.

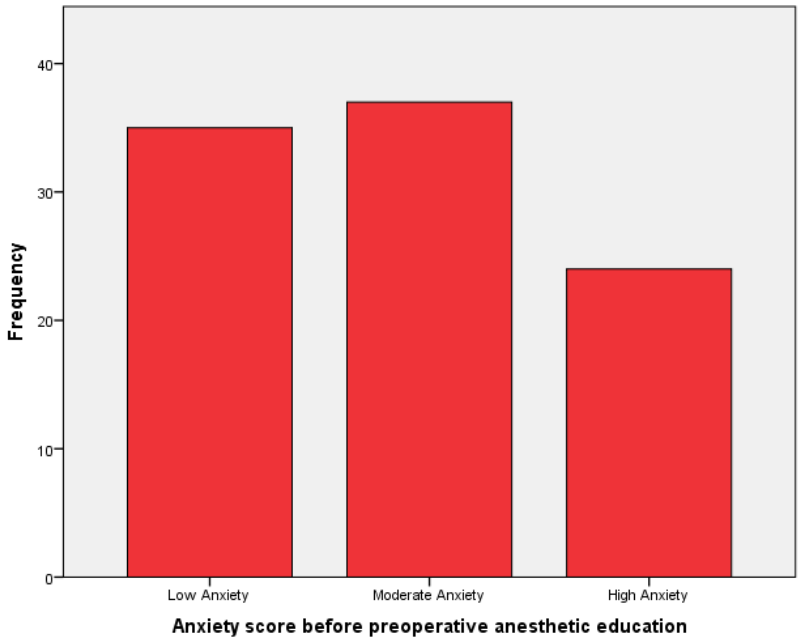

Figure 2: Anxiety level before education

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Anxiety Levels After Preoperative Anesthetic Education

Table 4.6 Anxiety Levels After Education

Statement	Frequency	Percentage(%)
Low anxiety	77	80.2%
Moderate anxiety	16	16.7%
High anxiety	3	3.1%
Total	96	100%

After receiving preoperative anesthetic education, 77 (80.2%) participants had low anxiety, 16 (16.7%) had moderate anxiety, and only 3 (3.1%) had high anxiety. The proportion of patients with low anxiety increased substantially following education, while the proportion with high anxiety decreased markedly.

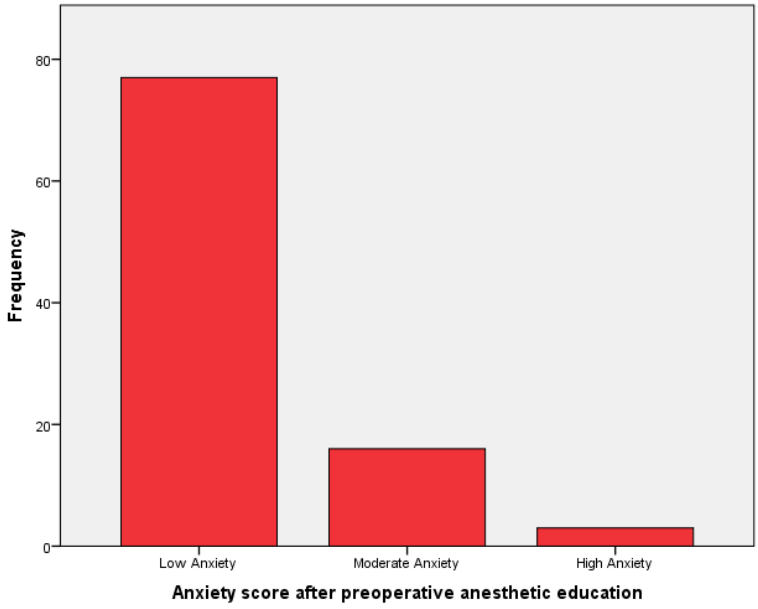

Figure 3: Anxiety level after education

Table 4.7 Descriptive Statistics of Patient Age and Pre-education and Post-education Anxiety Scores

Variable	N	Minimum	Maximum	Mean	Std.Deviation
Age	96	18	67	38.35	13.16

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Pre-education Anxiety	96	1	3	1.89	0.78
Post-education Anxiety	96	1	3	1.23	0.49

The study included 96 participants. The mean age of the patients was 38.35 ± 13.16 years, with a minimum age of 18 years and a maximum age of 67 years, indicating a wide age distribution among the study population.

The mean preoperative anxiety score before anesthetic education was 1.89 ± 0.78, while the post-education anxiety score decreased to 1.23 ± 0.49. This shows a reduction in anxiety levels after the provision of preoperative anesthetic education. Overall, the findings suggest that preoperative anesthetic education was associated with a decrease in patient anxiety levels.

Table 4.8 Paired Sample t-test of Anxiety Scores

Variable	Mean ± SD	t	df	p-value
Pre-education Anxiety	1.89 ± 0.78			
Post-education Anxiety	1.23 ± 0.49	10.213	95	<0.001

A paired-samples t-test was conducted to evaluate the overall impact of structured preoperative anesthetic education on patient anxiety levels across the entire study sample (N = 96). The results demonstrated a highly statistically significant reduction in anxiety scores from the pre-educational baseline phase to the post-educational assessment phase, t= 10.213, p < .001. The mean anxiety score decreased significantly from a pre-intervention level (M = 1.89, SD = .78) down to a post-intervention level (M = 1.23, SD = .49). This highly significant statistical drop provides clear, empirical proof that providing structured face-to-face anesthetic counseling and education effectively alleviates immediate psychological distress and preoperative dread for surgical patients.

4.3 Comparative Analysis: Major vs. Minor Surgical Patients

Table 4.9 Comparison of Preoperative Anxiety Scores between Minor and Major Surgery Patients

Surgery Type	N	Mean	Std. Deviation	t-value	df	Sig.2 (2-tailed)
Minor surgery	48	1.50	.61885	-5.553	94	.001
Major surgery	48	2.27	.73628			

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An independent-samples t-test was conducted to compare the baseline preoperative anxiety levels between patients scheduled for minor surgery and those scheduled for major surgery before receiving any anesthetic education. The results indicated a statistically significant difference between the two groups, $t(94) = -5.553$, $p < .001$.

Patients in the major surgery group exhibited a significantly higher mean anxiety score ($M = 2.2708$, $SD = .73628$) compared to patients in the minor surgery group ($M = 1.5000$, $SD = .61885$). The mean difference of 0.77083 indicates that individuals facing major surgical interventions experience inherently greater psychological distress and baseline anxiety prior to clinical educational interventions.

Table 4.10 Comparison of Post-education Anxiety Scores between Minor and Major Surgery Patients

Surgery Type	N	Mean	Std. Deviation	t-value	df	Sig.2 (2-tailed)
Minor surgery	48	1.1250	.39275	-2.114	84.341	.037
Major surgery	48	1.3333	.55862			

An independent-samples t-test was conducted to evaluate whether a significant variance in anxiety persisted between minor and major surgery patients after the administration of preoperative anesthetic education. Levene's test for equality of variances was statistically significant ($F = 15.791$, $p < .001$), indicating unequal variances; therefore, degrees of freedom were adjusted accordingly ($df = 84.341$).

The analysis revealed that the difference between the two groups remained statistically significant, $t(84.341)$. Following the educational intervention, the major surgery group still maintained a significantly higher residual anxiety mean ($M = 1.3333$, $SD = .55862$) than the minor surgery group, which fell to a lower mean score ($M = 1.1250$, $SD = .39275$). This demonstrates that while preoperative education effectively reduces anxiety across both groups, patients undergoing complex, major surgical procedures hold a higher baseline of residual dread that may require more intensive or tailored psychological counseling.

DISCUSSION

Clinical research from around the world shows that gender has a major impact on preoperative stress, with female patients regularly exhibiting greater baseline anxiety levels than male

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patients (Sürme et al., 2022). At the Peshawar Institute of Medical Sciences and Hayatabad Medical Complex, our study (41.7% female, 58.3% male) verified this baseline pattern. Nonetheless, post-intervention data demonstrated a statistically significant decrease in anxiety for both sexes, demonstrating that targeted therapeutic communication is beneficial for high-vulnerability female cohorts. These results allow anesthesiologists to recognize patients who need more compassionate preoperative care.

Preoperative anxiety is influenced by age, according to clinical research, with younger patients reporting acute baseline concerns and older persons frequently hiding fears through silent compliance (Samadi et al., 2024). Younger cohorts (18–40) expressed more active stress, but older participants (>60) remained restrained, according to our study (N = 96, mean age 38.35). Most importantly, everyone's anxiety levels dropped after the intervention. This shows that, regardless of the patient's age, systematic verbal and visual teaching successfully bridges the generational divide and offers crucial psychological comfort.

When compared to informal verbal counseling alone, research indicates that standardized tools such as Anesthesia Information Sheets greatly enhance patient comprehension and lower anxiety (Bagle et al., 2024). Structured preoperative counseling significantly changed the sample in our study: high-anxiety cases fell from 25.0% to just 3.1%, while low-anxiety patients increased from 36.5% to 80.2%. This declining trend was shown to be highly statistically significant ($p < 0.001$) by a paired sample t-test. These results provide strong evidence that structured anesthetic education is a very successful strategy for reducing preoperative anxiety.

According to research, patients undergoing major surgeries suffer multiple layers of stress that are resistant to simple informative templates, even when routine preoperative teaching is effective for low-risk cohorts (Charette et al., 2021). This tendency was reflected in our post-intervention data: the major surgery group stopped at a substantially higher mean of 1.33, whereas the minor surgery group fell to a calm anxiety mean of 1.13.The statistical significance of this variation was validated using an independent samples t-test ($p = 0.037$). No suggestionsThis demonstrates that in high-complexity cases, ordinary counseling leaves a lingering pocket of unresolved dread, underscoring the vital need for more comprehensive, specialized clinical counseling procedures to attain complete reassurance.

CONCLUSION

This study clearly shows how structured verbal preoperative anesthetic education and counseling can significantly reduce patient's anxiety before elective procedures. The empirical evidence supports a statistically significant decrease in preoperative anxiety scores after focused

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spoken therapeutic communication by analyzing a cohort of 96 patients from the Hayatabad Medical Complex and the Peshawar Institute of Medical Sciences.The comparison of surgical scales was a crucial aspect of this study. In comparison of patients, baseline anxiety in minor surgical patients was lower as compaired to major surgical patients, who had much higher baseline anxiety scores and a higher prevalence of severe psychological distress. Both groups anxiety scores significantly decreased as a result of the structured verbal educational intervention. This shows that the spoken educational framework is still very successful and helpful for preoperative anxiety even though it is strong enough to reduce the extreme anxiety related to high-risk big surgery. Additionally, the structured face-to-face verbal counseling efficiently overcame significant reading challenges for the majority of the sample (35.4%) without formal schooling while crossing demographic and generational differences among female and younger cohorts. Regardless of the patient's background or the extent of the surgical treatment, verbal preoperative education ultimately proves to be a very equitable, inexpensive, and clinically adaptable strategy that greatly improves patient psychological preparation.

RECOMMENDATIONS

- Routine preoperative anesthetic education should be implemented for all surgical patients.
- Additional counseling should be provided to patients undergoing major surgery.
- Standardized educational protocols should be developed in hospitals.
- Future studies with larger samples and multiple settings are recommended.
- Different educational approaches should be explored in future research.

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