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The Effect of Supportive Educational Intervention on Anxiety Levels in Preoperative Patients Undergoing Spinal Anesthesia

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Abstract: Surgical treatment is an invasive medical procedure that requires anesthesia to reduce pain caused by surgical incisions. Surgical intervention and anesthesia may act as psychological stressors that increase anxiety in patients before surgery. Preoperative anxiety can negatively affect patient comfort and readiness for surgery. One nonpharmacological approach to reduce anxiety is supportive education, which aims to improve patient understanding through structured teaching, guidance, emotional support, and the creation of a supportive learning environment. Methods: This study used a quantitative approach with a preexperimental one group pretest and posttest design. The study population consisted of patients undergoing surgery with spinal anesthesia at a tertiary military hospital in Purwokerto. Participants were selected using purposive sampling. Anxiety levels were measured using a preoperative anxiety assesment instrument consisting of six statements rated on a five point Likert scale. Results: Statistical analysis using the Wilcoxon signed rank test showed a significant difference in anxiety levels before and after the supportive education intervention, with a negative test statistic value and a probability value below the significant threshold. Conclusion: Supportive education was effective in reducing anxiety levels among patients undergoing surgery with spinal anesthesia.
Keywords: anxiety, preoperative care, spinal anesthesia, supportive education.

INTRODUCTION

Surgery is a medical procedure aimed at improving or restoring a patient's health condition through invasive actions, including cutting, removing, or destroying body tissues using specialized instruments such as scalpels, lasers, or needles [1]. Surgical procedures represent a form of medical therapy performed invasively by opening specific parts of the body that require treatment through an incision process, which is subsequently closed using suturing techniques [2]. Approximately 11% of the global burden of disease is attributed to conditions requiring surgical intervention as the primary therapeutic approach. Reports from the World Health Organization (WHO) indicate a significant increase in the number of patients undergoing surgical procedures annually. In 2017, approximately 140 million patients received surgical services worldwide, increasing to 148 million in 2019. At the national level, Indonesia reported around 1.2 million surgical cases during the same period [3].

Based on the National Health Data Tabulation of the Indonesian Ministry of Health in 2016, surgical procedures ranked eleventh among 50 disease patterns identified in Indonesia, accounting for 12.8% of cases. Of these, 32% were major surgeries, 25.1% were associated with mental disorders, and 7% were related to anxiety conditions [3]. Patients scheduled for surgery are typically offered one of three types of anesthesia. According to the American Society of Anesthesiologists, anesthesiology is a branch of medicine that focuses on pain management and comprehensive patient care during the preoperative, intraoperative, and postoperative phases [4].

The implementation of surgical procedures requires anesthesia to reduce pain sensation resulting from incisions. In general, anesthesia is classified into two main categories: general anesthesia and regional anesthesia. Regional anesthesia functions by blocking pain perception in specific areas of the body.

Similar to local anesthesia, patients remain conscious during the procedure but experience loss of sensation in the targeted area. In regional anesthesia, anesthetic agents are administered via injection around the spinal cord or along nerve pathways, effectively eliminating pain in specific body segments such as the hips, abdomen, upper extremities, and lower extremities [4]. Regional anesthesia is often preferred due to several advantages, including reduced incidence of nausea and vomiting, increased safety for patients with a full stomach or those who have not fasted, and easier postoperative monitoring management [5].

Regional anesthesia includes spinal anesthesia, epidural anesthesia, and combined spinal-epidural (CSE). Spinal anesthesia (subarachnoid anesthesia) is a type of regional anesthesia performed by injecting local anesthetic agents into the subarachnoid space. It is also known as intradural spinal block or intrathecal block. This procedure involves administering local analgesic drugs via injection into the subarachnoid space between lumbar vertebrae, typically at the L2–L3, L3–L4, or L4–L5 interspaces [6].

Medical procedures such as surgery and anesthesia have the potential to induce high levels of stress, which can trigger anxiety in patients undergoing these procedures. During the surgical process, patients are exposed to various stressors that generate feelings of anxiety and fear, even during the waiting period before surgery. Anxiety is a generalized and non-specific feeling of worry associated with uncertainty and helplessness. If not properly managed, anxiety can lead to both physical and psychological changes, including increased sympathetic nervous system activity. These effects may manifest as elevated heart rate, respiratory rate, blood pressure, cold sweating, nausea, urinary disturbances, and decreased overall energy levels, which can ultimately worsen the patient's condition [5].

Efforts to reduce patient anxiety during the preoperative period can be achieved by providing clear information regarding surgical and anesthetic procedures, along with emotional support [1]. One approach to reducing anxiety in the preoperative phase is enhancing patient understanding through supportive education. Supportive education is a form of health education that includes various methods such as teaching, guiding, supporting, and creating a developmental environment [7]. This method is designed to deliver health-related information to individuals or groups with the aim of promoting behavioral changes after gaining an understanding of anesthesia procedures [8]. Supportive education differs from general health education in that it not only focuses on improving cognitive aspects but also emphasizes providing support, guidance, and instruction to patients [9]. The guidance and support provided can serve as a means to maintain patient stability and prevent inappropriate decision-making [10].

Previous research conducted by [11] examined the effect of anesthesia education on anxiety levels in preoperative appendicitis patients at Elim Rantepao Hospital. The study employed a quasi-experimental design with a one-group pretest-posttest approach and purposive sampling technique. The results indicated that the majority of respondents were female. After receiving educational intervention regarding anesthesia, there was a statistically significant reduction in anxiety levels among preoperative appendicitis patients, suggesting that education is effective in reducing preoperative anxiety.

The similarity between that study and the present study lies in the sampling technique, as both used purposive sampling based on specific characteristics and research objectives. However, differences exist in the research design and the anxiety measurement instruments used. Palamba's study applied a quasi-experimental design with the Hamilton Anxiety Rating Scale, whereas this study uses a pre-experimental design with the Amsterdam Preoperative Anxiety and Information Scale (APAIS), which is specifically developed to measure anxiety levels and information needs in preoperative patients.

Another previous study conducted by [12] investigated the effect of dhikr therapy on anxiety levels in preoperative cesarean section patients. This study employed a quantitative method with a pre-experimental one-group pretest-posttest design and purposive sampling. The Wilcoxon test results showed a p-value below the significance threshold, indicating that dhikr therapy had a significant effect in reducing anxiety levels before cesarean section procedures.

The similarity between that study and the present study lies in the methodological approach, as both use quantitative methods with a pre-experimental one-group pretest-posttest design and purposive sampling techniques. The main difference lies in the independent variable and the anxiety measurement instruments.

Nopriani's study used dhikr therapy with the Zung Self-Rating Anxiety Scale, while this study applies supportive education as the independent variable and uses the Amsterdam Preoperative Anxiety and Information Scale (APAIS), which is specifically designed to assess anxiety levels and information needs in preoperative patients.

The conceptual framework of this study illustrates the relationship between supportive education as the independent variable and anxiety levels in preoperative patients undergoing spinal anesthesia as the dependent variable. Supportive education is provided prior to surgery with the aim of enhancing patient understanding, psychological readiness, and sense of security regarding spinal anesthesia procedures. Subsequently, patient anxiety levels are measured and classified into five categories: no anxiety, mild anxiety, moderate anxiety, severe anxiety, and very severe anxiety. This conceptual framework emphasizes that supportive education is expected to influence and reduce patient anxiety levels before undergoing surgery with spinal anesthesia.

This study aims to identify the general characteristics of respondents, including age, gender, education level, and surgical history, as an initial profile of preoperative patients. Additionally, it aims to determine the anxiety levels of preoperative patients undergoing spinal anesthesia before receiving supportive education as a baseline condition. Furthermore, the study seeks to measure anxiety levels after the implementation of supportive education to evaluate changes in patients' psychological conditions during the preoperative phase. Finally, this study aims to analyze the effect of supportive education on anxiety levels in preoperative patients undergoing spinal anesthesia, thereby determining the effectiveness of the intervention in reducing patient anxiety.

RESEARCHMETHOD

Research Design

This study employed a quantitative approach with a pre-experimental one-group pretest-posttest design. Quantitative research is a type of research in which the entire process, starting from proposal development, field implementation, hypothesis formulation, data analysis, conclusion drawing, and report writing, is based on the principles of measurement, calculation, the use of statistical formulas, and the certainty of numerical data [21]. Experimental research is a type of study designed to examine the effect of a treatment on the outcomes or impacts resulting from that treatment [18]. In this research design, the sample was first given an initial measurement (pretest) before the intervention was administered. Subsequently, after the intervention was provided, a second measurement (posttest) was conducted to assess the changes that occurred [12].

Measurement and Data Collection

In this study, the researchers used an instrument adopted from the Amsterdam Preoperative Anxiety and Information Scale (APAIS). APAIS is an instrument used to measure anxiety levels in preoperative patients. This instrument has been translated into various languages, including Indonesian, and has demonstrated good validity and reliability. The Indonesian version of APAIS has undergone validity and reliability testing with satisfactory results. The reliability test showed good internal consistency based on Cronbach's Alpha values. For the anxiety component, which consists of items 1, 2, 4, and 5, the Cronbach's Alpha value was 0.825, while for the information needs component, which includes items 3 and 6, the Cronbach's Alpha value was 0.863. A Cronbach's Alpha value indicating good reliability generally falls within the range of 0.7 to 0.9 [22]. Cronbach's Alpha values range from 0 to 1, and an instrument is considered to have good internal consistency if it obtains a value greater than 0.70, indicating that the indicators within the instrument are reliable [23].

The Amsterdam Preoperative Anxiety and Information Scale (APAIS) was specifically developed to assess anxiety related to anesthesia procedures and surgical interventions. Therefore, APAIS is used to measure situational anxiety specific to the preoperative condition. This instrument includes an assessment of patient anxiety regarding anesthesia, anxiety regarding surgery, and the patient's need for information. APAIS consists of six items, including four items to measure anxiety levels and two items to assess the patient's need for information [24]. Therefore, the Amsterdam Preoperative Anxiety and Information Scale (APAIS) is recognized as an instrument specifically designed to measure anxiety levels during the preoperative phase [25].

The APAIS instrument consists of only six questions, so the time required to complete the questionnaire is relatively short. This makes it easier for preoperative patients to understand and respond to the questions, even when they have limited time before undergoing medical procedures. The Amsterdam Preoperative Anxiety and Information Scale (APAIS) uses a five-point Likert scale for each statement item, with a total of six questions [26].

Data Analysis

The data analysis technique in this study was intended to determine the relationship between the independent and dependent variables. The independent variable in this study was supportive education, while the dependent variable was anxiety level. To test the effect of supportive education on the anxiety levels of preoperative patients before and after the intervention, the Wilcoxon Signed-Rank Test was used. The Wilcoxon test was chosen to identify differences between pretest and posttest scores in non-parametric or ordinal data [27]. The entire data analysis process was conducted using IBM SPSS Statistics version 23 software. The results of the Wilcoxon Signed-Rank Test showed a p-value of 0.00. Since this p-value was smaller than the significance level of 0.05, the null hypothesis (H_0) was rejected [28].

RESULTS AND DISCUSSION

Results

Based on the results of the study conducted at TK. III Wijayakusuma Hospital, Purwokerto, involving 45 respondents and using the APAIS questionnaire as the data collection instrument, the following results were obtained. Each figure must be provided with a caption placed below the figure. Table captions should be placed above the table. Captions should be written in lowercase letters except for the first letter of each sentence. All figures must be numbered sequentially. Figures should be centered on the page, whereas tables should be aligned to the left margin of the page.

Table 1. Characteristics of Preoperative Patients Undergoing Spinal Anesthesia

Characteristics	Frequency (F)	Percentage (%)
Age		
Adolescents (11–18 years)	2	4.4
Adults (19–59 years)	42	93.3
Elderly (≥60 years)	1	2.2
Gender		
Male	21	46.7
Female	24	53.3
Education Level		
Primary School (SD/MI)	13	28.9
Junior High School (SLTP)	8	17.8
Senior High School (SLTA)	21	46.7
Higher Education	3	6.7
Surgic		
Characteristics	Frequency (F)	Percentage (%)
Age		

Table 1 shows the characteristics of the respondents. Of the 45 patients included in the study, the majority were in the adult age group (19–59 years), accounting for 42 respondents (93.3%). Based on gender, female respondents predominated, with 24 individuals (53.3%). In terms of educational level, the largest proportion of respondents had completed senior high school (SLTA), totaling 21 respondents (46.7%).

Table 2. Frequency Distribution of Anxiety Levels in Preoperative Patients Undergoing Spinal Anesthesia Before Supportive Educational Intervention

Anxiety Level Score	Frequency (F)	Percentage (%)
7–12 (Mild Anxiety)	8	17.8
13–18 (Moderate Anxiety)	13	28.9
19–24 (Severe Anxiety)	20	44.4
25–30 (Very Severe Anxiety)	4	8.9

Based on the results presented in Table 2, the anxiety levels of respondents prior to the supportive educational intervention indicate that the majority experienced severe anxiety, within the score range of 19–24, accounting for 20 respondents (44.4%).

Table 3. Frequency Distribution of Anxiety Levels in Preoperative Patients Undergoing Spinal Anesthesia After Supportive Educational Intervention

Anxiety Level Score	Frequency (F)	Percentage (%)
7–12 (Mild Anxiety)	3	6.7
13–18 (Moderate Anxiety)	24	53.3
19–24 (Severe Anxiety)	10	22.2
25–30 (Very Severe Anxiety)	1	2.2

Based on the results presented in Table 3, after the implementation of the supportive educational intervention, the majority of respondents experienced moderate anxiety, within the score range of 13–18, accounting for 24 respondents (53.3%).

The normality test in this study was conducted using the Shapiro–Wilk test, as the sample size consisted of 45 respondents. The initial stage of data analysis began with the normality test, which was used to determine whether the data were normally distributed. The normality testing of both pretest and posttest scores in this study employed the Shapiro–Wilk test because the sample size was less than 50. If the significance value is ≥ 0.05, the data are considered to be normally distributed [29]. The data analyzed in the normality test consisted of pretest and posttest scores. The criteria for interpretation state that if the significance value exceeds 0.05, the data are normally distributed; otherwise, they are not normally distributed [30].

Table 4. Shapiro–Wilk Normality Test

	Shapiro-Wilk		
	Statistik	**n**	**Sig.**
Pretest	0,861	45	0,000
Posttest	0,823	45	0,000

Based on the results presented in Table 4, the normality test using the Shapiro–Wilk test showed a significance value of 0.000 for both pre-intervention and post-intervention data. Since the significance value is < 0.05, the null hypothesis is rejected, indicating that the anxiety level scores before and after the supportive educational intervention in preoperative patients undergoing spinal anesthesia are not normally distributed.

After conducting the normality test, it can be determined whether the data follow a normal distribution. If the data are normally distributed, further analysis can be performed using the Paired Sample t-test to examine differences between pretest and posttest scores. However, if the normality test indicates that the data are not normally distributed, the analysis of differences is conducted using the Wilcoxon Signed-Rank Test, which is a non-parametric test [31].

Based on the normality test results, the variables analyzed were not normally distributed. Therefore, the subsequent analysis employed the Wilcoxon Signed-Rank Test, a non-parametric method suitable for data that do not meet the assumption of normality. This test was used to determine the effect of the supportive educational intervention on anxiety levels in preoperative patients undergoing spinal anesthesia at TK. III Wijayakusuma Hospital, Purwokerto.

Table 5. Differences in Anxiety Levels Before and After Supportive Educational Intervention in Preoperative Patients Undergoing Spinal Anesthesia

Comparison	Category	N	Z	p-value
Posttest Anxiety – Pretest Anxiety	Negative Rank	28	-4.842	0.000
	Positive Rank	0		
	Ties	17		

Based on Table 5, the total sample in the supportive educational intervention group consisted of 45 respondents. The analysis results showed that the number of negative ranks was 28 respondents, indicating that 28 respondents experienced a decrease in anxiety levels after receiving the supportive educational intervention. Meanwhile, the positive rank value was 0, indicating that no respondents experienced an increase in anxiety levels after the intervention. In addition, there were 17 respondents categorized as ties, indicating that their anxiety levels remained unchanged after the intervention.

The results of the bivariate analysis using the Wilcoxon Signed-Rank Test revealed a significant difference in anxiety levels before and after the supportive educational intervention. The analysis yielded a Z value of -4.842 with a p-value of 0.000 ($p < 0.05$). Since the p-value is lower than the significance level of 0.05, the null hypothesis (H_0) is rejected and the alternative hypothesis (H_1) is accepted. This indicates that the supportive educational intervention has a significant effect in reducing anxiety levels among preoperative patients undergoing spinal anesthesia at TK. III Wijayakusuma Hospital, Purwokerto.

Discussion

Characteristics of Preoperative Patients Undergoing Spinal Anesthesia Based on Age

Based on the results presented in Table 1, the majority of respondents experiencing anxiety were in the adult age group (19–59 years), totaling 42 respondents (93.3%). This finding is consistent with previous literature [32], which defines adulthood within a similar age range. It is also in line with the study by Sari (2025) on surgical education interventions to reduce anxiety in preoperative cesarean section patients, where most respondents were in early adulthood (26–35 years), accounting for 18 patients (60%) [33]. Late adolescence to early adulthood represents a critical period in the development of coping strategies. An individual's readiness to face surgical procedures is influenced by their level of maturity, which is associated with improved emotional regulation resulting from more effective coping mechanisms [34]. As age increases, personal maturity and the ability to apply coping strategies tend to improve [35].

Characteristics Based on Gender

The study results showed that the majority of respondents were female, with 24 respondents (53.3%), compared to 21 male respondents (46.7%). This finding is consistent with previous research by Mulyadi (2023), which reported that 54.2% of respondents were female [36]. Higher levels of anxiety are often observed in females, which may be associated with a more reactive autonomic nervous system response compared to males. Additionally, hormonal fluctuations, particularly estrogen, play a role in influencing anxiety levels in females. Although estrogen is also present in males, its levels are relatively lower, which may contribute to the lower prevalence of intense anxiety among males [37].

Characteristics Based on Education Level

Based on the respondents' educational background, most participants had completed senior high school (SLTA), accounting for 21 respondents (46.7%). This finding is consistent with the study by Ratnasari (2025), which reported that the majority of respondents also had a senior high school education (50%) [38]. Several studies have demonstrated a significant relationship between education level and anxiety. Educational background influences how individuals perceive preoperative situations, which in turn affects how anxiety develops and is managed. The perception framework shaped through education ultimately regulates patients' emotional responses to the conditions they face [33].

Characteristics Based on Surgical History

The majority of respondents had no prior surgical experience, totaling 30 respondents (66.7%). This finding is consistent with Mulyadi (2023), which reported that 79.2% of respondents had never undergone surgery [36]. Previous surgical experience can serve as a reference for understanding medical procedures, thereby reducing the perception of surgery as a threat. Preoperative anxiety is an anticipatory response that arises when individuals face situations perceived as threatening, whether to their life roles, bodily integrity, or survival [39].

Pre-Intervention Anxiety Levels

The results of this study indicate that most respondents experienced severe anxiety prior to receiving the supportive educational intervention, accounting for 44.4%. This finding is consistent with Mulyadi (2023), where the highest anxiety levels before intervention were also in the severe category (70.8%) [36]. Patients undergoing surgery require clear and easily understandable information, which can be effectively delivered through health education. Adequate personal maturity enables patients to better receive and comprehend the information provided by healthcare professionals regarding surgical procedures [35].

Post-Intervention Anxiety Levels

The study results show that after receiving the supportive educational intervention, the majority of patients experienced moderate anxiety (53.3%). Respondents reported a reduction in anxiety levels, reflected in a more relaxed state, increased confidence, and reduced tension. This finding is consistent with Mulyadi (2023), which reported a decrease in anxiety levels after intervention, with the highest proportion in the moderate category (50.0%) [36]. Adequate understanding of the procedures helps reduce patient anxiety. Preoperative education is a supportive nursing intervention aimed at optimizing patients' physical and psychological conditions before and after surgery [16].

Effect of Supportive Educational Intervention on Anxiety Levels

The results indicate that supportive educational intervention has a significant effect in reducing anxiety levels among preoperative patients undergoing spinal anesthesia. This is evidenced by the Wilcoxon Signed-Rank Test results ($Z = -4.842$; p-value $= 0.000 < 0.05$), leading to the rejection of H_0 and acceptance of H_1. Therefore, supportive educational intervention is proven to significantly reduce anxiety levels in preoperative patients at TK. III Wijayakusuma Hospital, Purwokerto.

This finding is consistent with Ratnasari (2025), who investigated the effect of video-based health education on anxiety reduction in preoperative fracture patients. The study reported a p-value of 0.001, indicating a significant difference between pre- and post-intervention anxiety levels [38].

Preoperative anxiety can affect both physical and psychological conditions, potentially increasing the risk of complications and influencing postoperative recovery. Unmanaged anxiety before surgery may lead to increased blood pressure, cardiac rhythm disturbances, and higher requirements for anesthetics and analgesics during surgery [40]. Various approaches can be used to reduce anxiety, including the provision of educational information. Preoperative education has been shown to improve postoperative outcomes and accelerate recovery, especially in patients requiring additional support or those with limited mobility [41].

One approach to education is supportive education, which is based on Orem's nursing theory. This method involves techniques such as teaching, guiding, supporting, and providing a conducive environment, and plays a significant role in enhancing patients' self-care agency [42]. Supportive education refers to a set of nursing approaches aimed at improving patient understanding, self-care behavior, and quality of life [43].

Supportive education differs from conventional health education as it not only focuses on cognitive improvement but also emphasizes guidance, emotional support, and environmental facilitation. This method strengthens individual capacity through two-way communication, affective support, and problem-solving assistance [44]. As a result, it enables effective identification and management of patient challenges, ultimately encouraging voluntary behavioral change based on awareness and understanding. Supportive education has been shown to positively contribute to increased patient knowledge, reduced stress levels, and behavioral changes [44].

CONCLUSION

Based on the characteristics of the study subjects, the population involved was dominated by adult patients, with a higher proportion of female patients compared to male patients. Most respondents had a secondary to higher educational background, indicating a sufficient ability to receive and understand health-related information. The psychological condition of patients before the intervention showed that anxiety was a major problem, with severe anxiety being the most frequently observed category. These findings indicate that preoperative procedures involving spinal anesthesia have the potential to cause significant psychological distress in patients.

After the implementation of supportive education, a shift in anxiety levels toward a lower category was observed, with most patients falling into the mild anxiety category. This change indicates an improvement in the patients' emotional condition after receiving systematically delivered information and support. Statistically, bivariate analysis using the Wilcoxon Signed-Rank Test demonstrated a significant difference between anxiety levels before and after the intervention. These findings confirm that supportive education plays a significant role in reducing anxiety levels among preoperative patients undergoing spinal anesthesia. Therefore, this intervention may be considered as part of the preoperative nursing approach at TK. III Wijayakusuma Hospital, Purwokerto.

The results of this study are expected to serve as an alternative non-pharmacological intervention for reducing anxiety levels in preoperative patients undergoing spinal anesthesia through the implementation of supportive education in accordance with standard operating procedures. These findings may also serve as a reference for the development of future research and anesthesiology nursing practice. Considering the limitations of this study, future studies are recommended to use a stronger research design, a larger sample size, and a Randomized Controlled Trial (RCT) method, including the exploration of the overload education aspect. In addition, the implementation of supportive education within family and community contexts is expected to improve the sustainability of the intervention's benefits.

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