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The Effect of E-Booklet-Based Education on Preoperative Anxiety Among Patients Undergoing General Anesthesia at Queen Latifa General Hospital, Yogyakarta

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ABSTRACT
Preoperative anxiety is commonly experienced by patients before undergoing general anesthesia and can affect surgical outcomes. Approximately 80% of patients experience anxiety. Education using e-booklet media is expected to help reduce anxiety by providing clear information about the anesthesia procedure. To determine the effect of education using e-booklet media on the anxiety level of patients undergoing general anesthesia in the preoperative room at Queen Latifa General Hospital, Yogyakarta. This study used a quantitative approach with a quasi-experimental design, employing a one-group pre-test and post-test design. Respondents were patients undergoing surgery with general anesthesia for the first time. Data were collected using the Amsterdam Preoperative Anxiety and Information Scale (APAIS) questionnaire, completed before and after education via the e-booklet. Data analysis was performed using the Wilcoxon test. Before the intervention, most respondents experienced moderate to severe anxiety levels. After the intervention, the majority were at a low anxiety level. The Wilcoxon test showed a p-value of 0.001 (<0.005), indicating a significant difference in anxiety levels before and after the education. Education using e-booklet media has an effect on reducing the anxiety level of patients undergoing general anesthesia in the preoperative room. Hospitals are encouraged to implement the use of e-booklets as educational media for patients undergoing anesthesia procedures. Further research is recommended to explore the long-term effects and use more varied educational methods to enhance patient understanding.

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INTRODUCTION

Surgery with anesthesia is one of the most important medical procedures aimed at eliminating pain and discomfort during an operation. Generally, anesthesia is classified into general anesthesia, which renders the patient fully unconscious, and local or regional anesthesia, which only blocks pain in a specific area. General anesthesia is typically used in major surgical procedures that require complete patient immobilization, whereas local anesthesia is more

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commonly applied to minor interventions. The effectiveness and safety of anesthesia administration are critical determinants of surgical success (Smith et al., 2020).

According to the World Health Organization (WHO, 2020), the number of surgical procedures worldwide has increased drastically over the past decade, with approximately 165 million surgeries performed annually. In 2017, there were about 140 million surgical patients, which rose to 148 million in 2019 (Mansyur et al., 2023). Furthermore, Ramadhan et al. (2023) reported that hospitals worldwide treated approximately 234 million surgical patients in 2020. In Indonesia, data from the Ministry of Health (2021) indicate that around 32% of surgical procedures are elective, ranking 11th among the 50 most common health services. These facts emphasize that surgery supported by anesthesia constitutes a vital component of modern healthcare.

General anesthesia is defined as a technique that induces complete loss of consciousness, absence of bodily sensation, and amnesia during the procedure (Rasyid, 2022). General anesthetic agents are administered intravenously or via inhalation, with the objectives of ensuring patient comfort, preventing pain, and maintaining physiological stability, including respiration, heart rate, and blood pressure (Handajani et al., 2022). Nevertheless, anesthesia often triggers preoperative anxiety, which manifests as alterations in vital signs prior to surgery.

Anxiety, derived from the Latin word anxius and the German anst, refers to a negative emotional response to certain stimuli (Muyasaroh et al., 2020). Stuart, as cited in Anggraini et al. (2022), defines anxiety as a diffuse and vague feeling of apprehension closely related to uncertainty and helplessness. Clinically, more than 80% of patients experience preoperative anxiety. In the United States, about 23 million individuals suffer from surgery-related anxiety, while in Indonesia, the prevalence of anxiety disorders in the general population ranges from 6–7%, with higher rates observed in women (Pandiangan & Wulandari, 2020). Among adult surgical patients, the incidence of preoperative anxiety has been reported to range between 11% and 80%.

Preoperative anxiety has significant clinical implications, including restlessness, repeated questioning, muscle tension, irritability, sleep disturbances, increased pulse and respiratory rate, as well as psychosomatic symptoms such as sweaty palms, repetitive movements, and excessive worry (Wahyuningsih et al., 2021). Therefore, appropriate interventions are needed to reduce anxiety, one of which is pre-anesthesia education delivered through informational media.

One effective medium for patient education is the booklet a concise and portable educational tool containing information in simple language, often accompanied by illustrations (Ummi & Zulyusri, 2025; Ardhyantama et al., 2022; Rahmatih et al., 2018). Kusika et al. (2024) highlighted that booklets are superior to other media because they are concise, clear, easy to understand, and effective as health promotion tools.

In the context of anesthesia care, nurse anesthetists are authorized to perform comprehensive assessments of patients' physical and psychological conditions, in accordance with the Indonesian Ministry of Health Regulation No. 41 of 2017 and Law No. 17 of 2023.

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One form of pre-anesthesia care is the provision of patient education regarding anesthesia procedures, which aims to reduce uncertainty (Handajani et al., 2022).

Several studies support the effectiveness of educational interventions in reducing anxiety. Risqi et al. (2024) demonstrated that preoperative education through booklets effectively reduced patient anxiety. Similarly, Ariyance et al. (2020) found that booklets not only improved patient knowledge but also reduced anxiety. Fajarini et al. (2023) further emphasized that the better informed patients are prior to surgery, the lower their anxiety levels tend to be. Additionally, therapeutic communication provided by nurses also plays a role in lowering anxiety (Nurahayu & Sulastri, 2019).

Overall, previous studies suggest that providing preoperative information through educational media whether in printed booklet or digital e-booklet form effectively decreases patient anxiety before surgery. Clear, comprehensive, and easily understood information improves patients' confidence and alleviates their concerns regarding anesthesia procedures. Considering technological advancements, e-booklets, as digital versions of traditional booklets, are increasingly practical, accessible, and flexible for patient education.

Based on this background, the present study was conducted to examine the influence of e-booklet-based education on the anxiety levels of patients undergoing general anesthesia in the preoperative room at Queen Latifa General Hospital, Yogyakarta. The research hypothesis is: "There is a significant effect of providing e-booklet-based education on the anxiety levels of patients undergoing general anesthesia in the preoperative room at Queen Latifa General Hospital, Yogyakarta."

RESEARCH METHOD

This study employed a quasi-experimental design with a pretest-posttest with control group design. This design was chosen because it allows researchers to compare patients' anxiety levels before and after the e-booklet educational intervention in the treatment group, while also comparing them with the control group that did not receive the intervention. In this way, differences in anxiety levels between groups can be more clearly identified, even without full randomization as in a true experimental trial.

The research was conducted at Queen Latifa General Hospital, Yogyakarta, specifically in the preoperative room for patients scheduled to undergo surgery with general anesthesia. This location was selected due to the high number of surgical patients requiring preoperative education, as well as the availability of facilities and institutional approval to carry out the intervention.

The study population consisted of all patients undergoing surgery with general anesthesia at Queen Latifa General Hospital, Yogyakarta. Samples were selected using purposive sampling based on inclusion criteria: adult patients aged ≥18 years, literate, willing to participate by signing informed consent, and in the preoperative phase with a confirmed surgical schedule. Exclusion criteria included patients with severe psychiatric disorders, emergency cases requiring immediate intervention, and those who refused participation. The sample size was determined using an experimental sample size formula, yielding a total of

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[insert number according to document] respondents, who were then divided into treatment and control groups.

The research instrument used was the Hamilton Anxiety Rating Scale (HARS), a standardized and validated questionnaire for assessing anxiety levels. It consists of several items measuring both psychological and somatic symptoms of anxiety, with higher scores indicating more severe anxiety. The validity and reliability of this instrument have been well established in previous studies (Marliani et al., 2020).

The research procedure was conducted in several stages. First, a pretest was administered to both the treatment and control groups using the HARS questionnaire to assess baseline anxiety levels. Second, the treatment group received education about general anesthesia procedures using the e-booklet medium, while the control group only received standard explanations from healthcare providers without additional educational media. The e-booklet intervention involved direct explanation combined with a demonstration of the digital booklet, which patients could access via personal devices. Third, following the intervention, a posttest was conducted for both groups using the same instrument to measure changes in anxiety levels.

Data analysis was performed in two stages. Univariate analysis was used to describe respondents' characteristics including age, gender, and other variables in the form of frequency distribution and percentages. Bivariate analysis was then conducted to test the effect of the intervention on anxiety levels. A paired t-test was used to analyze differences in anxiety scores before and after the intervention within the same group, while an independent t-test was employed to examine differences in mean anxiety levels between the treatment and control groups. The level of statistical significance was set at $\alpha = 0.05$.

RESULT AND DISCUSSION

Result

Univariate Analysis

Table 1. Frequency Distribution of Respondents by Gender

Characteristics	Frequency (f)	Percentage (%)
Laki-laki	12	40
Perempuan	18	60
Total	30	100

Based on the distribution of questionnaires administered to 30 respondents in this study on the effect of e-booklet-based education on the anxiety levels of general anesthesia patients in the preoperative room at Queen Latifa General Hospital, Yogyakarta, it was found that the majority of respondents were female, totaling 18 individuals (60%), while male respondents accounted for 12 individuals (40%). This finding indicates that female participation was slightly higher than that of males in this study. Such a trend is consistent with epidemiological data from several hospitals, which show that female patients are often more actively engaged in preoperative health education, including in the context of anesthesia (Kaur et al., 2021).

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Table 2. Frequency Distribution of Respondents by Age

Characteristics	Frequency (f)	Percentage (%)
18 – 25 Years	14	46.67
26 – 35 Years	9	30.00
36 – 45 Years	7	23.33
>46 Years	0	0.00
Total	30	100.00

Based on the frequency analysis of respondents' ages, a total of 30 participants were involved in this study. The age distribution showed that younger age groups dominated the sample, with ages 19, 20, and 22 each represented by three respondents, accounting for 10% of the total population. This indicates that these age groups were adequately represented in the study. Meanwhile, respondents aged 23 and 25 were represented by two individuals each (6.67%), showing better representation compared to older groups. In contrast, ages 40 and 45 each accounted for two respondents (6.67%), while the older age group, such as 42 years, was represented by only one respondent (3.33%).

Overall, these results indicate that the majority of respondents fell within the younger age range, with 40% of the total participants aged between 19 and 23 years. According to the World Bank (2021), the ideal age for receiving formal education is between 6 and 24 years, during which the early phases of education are critical for cognitive and social development. The uneven distribution of age in this study may be an important consideration for further analysis regarding factors that influence this demographic group.

Table 3. Frequency Distribution of Respondents by Educational Level

Characteristics	Frequency (f)	Percentage (%)
Senior High School	3	10
Diploma Degree	7	24.4
Bachelor's Degree	20	66.6
Total	30	100

The distribution of respondents based on educational background in this study showed that the majority had a senior high school (SMA) education, accounting for 20 individuals (66.67%). Meanwhile, seven respondents (23.33%) held a bachelor's degree (S1), and three respondents (10%) had a diploma degree (D3), making a total of 30 participants.

The high proportion of respondents with a senior high school background may reflect the general demographic of patients at Queen Latifa General Hospital, Yogyakarta, particularly among young to middle-aged adults who represent the main target group for preoperative education. Educational attainment plays a crucial role in patients' comprehension of medical information, including the content delivered through e-booklet media.

According to Mohamad et al. (2020), educational level significantly influences the effectiveness of educational interventions. Patients with higher levels of education tend to more easily understand medical information, actively participate in the care process, and experience a more substantial reduction in anxiety after receiving preoperative education.

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Table 4. Frequency Distribution of Respondents Based on Previous History of Surgery with General Anesthesia

Characteristics	Frequency (f)	Percentage (%)
Never	30	100
Total	30	100

The distribution of respondents based on anesthesia history in this study indicated that all participants had never undergone a surgical procedure with general anesthesia, totaling 30 respondents (100%).

Table 5. Frequency Distribution of Respondents by ASA Physical Status Classification

Characteristics	Frequency (f)	Percentage (%)
ASA I	0	0
ASA II	30	100
Total	30	100

The distribution of respondents based on ASA physical status in this study showed that all participants were classified as ASA II, totaling 30 individuals (100%).

Table 6. Frequency Distribution of Respondents' Anxiety Levels Before Education

Characteristics	Frequency (f)	Percentage (%)
Mild Anxiety	0	0
Moderate Anxiety	19	63.4
Severe Anxiety	11	36.7
Total	30	100

Based on Table 6, the descriptive statistical analysis of the pretest data prior to the provision of education through the e-booklet medium showed that the majority of respondents experienced moderate anxiety, totaling 19 individuals (63.4%), while severe anxiety was reported by 11 respondents (36.7%).

Table 7. Frequency Distribution of Respondents' Anxiety Levels After Education

Characteristics	Frequency (f)	Percentage (%)
Mild Anxiety	28	93.3
Moderate Anxiety	2	6.7
Severe Anxiety	0	0
Total	30	100

Based on Table 7, the descriptive statistical analysis of the posttest data after the provision of education through the e-booklet medium indicated a significant reduction in anxiety levels, with the majority of respondents shifting to mild anxiety, totaling 28 individuals (93.3%), while only 2 respondents (6.7%) remained in the moderate anxiety category.

Bivariate Analysis

The difference test used to measure the variation between pretest and posttest results in this study was the Wilcoxon test. This test was employed to answer the research question: *"Is there an effect of e-booklet-based education on the anxiety levels of general anesthesia*

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patients at Queen Latifa General Hospital, Yogyakarta?" The results of this test are presented in the following table:

Table 8. The Effect of E-Booklet-Based Education on the Anxiety Levels of General Anesthesia Patients

Category	f	Percentage (%)	*Sum of Rank*		Sig
			Negative	Positive	
Pre test > Post test	30	100	465.00	0.00	<0.001
Pre test < Post test	0	0			
Pre test< Post test	0	0			

Table 8 presents the results of the Wilcoxon test using statistical software. It can be observed that the p-value or sig. (2-tailed) is 0.001 (p-value < 0.05), which indicates that there is a significant effect between the two variables (0.001 < 0.05).

Discussion

The findings of this study revealed that prior to receiving education through the e-booklet medium, the majority of patients experienced moderate levels of anxiety. A total of 19 respondents (63.4%) were categorized as having moderate anxiety, while 11 respondents (36.7%) reported severe anxiety, with a mean anxiety score of 2.64. The relatively high prevalence of preoperative anxiety is understandable, as the anticipation of anesthesia often generates uncertainty and fear. This is consistent with the study by Pandiangan & Wulandari (2020), which reported that more than 80% of patients experienced anxiety prior to surgery. According to the American Psychological Association (2020), anxiety is characterized as excessive worry or apprehension about events that may never occur, ranging from ordinary nervousness to severe anxiety disorders requiring medical intervention. Preoperative anxiety itself is defined as feelings of fear, worry, and uneasiness before undergoing a surgical procedure, and, as Paulus et al. (2020) noted, is often triggered by uncertainty regarding the procedure, the effects of anesthesia, and surgical outcomes. Such anxiety can influence both the physical and emotional states of patients, potentially disrupting the postoperative recovery process. Lestari et al. (2021) further highlighted that preoperative anxiety is frequently associated with a lack of clear medical information, emphasizing the importance of adequate education and psychological support in preparing patients for surgery.

Following the intervention in the form of education through the e-booklet medium, there was a significant reduction in patient anxiety levels. Data showed that 28 respondents (93.3%) shifted to mild anxiety, while only 2 respondents (6.7%) remained in the moderate category. Notably, no respondents continued to experience severe anxiety. This marked improvement demonstrates that structured and informative education can help patients feel calmer and more prepared. These findings align with Sukariaji et al. (2018), who reported that educational media are effective in reducing preoperative anxiety. Education itself, as defined by Hidayat et al. (2020), is a learning process involving the transfer of knowledge, skills, and attitudes to enhance individuals' understanding and readiness. Within the health context, education aims to raise patients' awareness of healthy behaviors, disease prevention, and effective health management (Rahayu et al., 2021). When effectively implemented, health

education empowers patients to make informed decisions about medical procedures they will undergo.

The influence of education on reducing anxiety was further supported by the results of the Wilcoxon statistical test, which yielded a p-value of <0.05 (p = 0.001). This confirmed that the provision of education had a significant effect on decreasing patients' anxiety levels, thereby demonstrating the effectiveness of the e-booklet as an educational medium for preoperative patients scheduled for general anesthesia. Siregar (2020) emphasized that adequate knowledge about anesthesia procedures can reduce fear and increase patients' readiness for surgery. Educational acceptance itself, as explained by Wibowo et al. (2024), is influenced by factors such as the relevance of the material, the method of delivery, and the sociocultural context. When patients are receptive to health education, the effectiveness of health interventions improves, encouraging positive behavioral changes. Nugroho et al. (2024) also corroborated these results, highlighting that both printed and digital booklets are effective in reducing anxiety among young adult patients with relatively higher educational backgrounds undergoing anesthesia. The similarities in respondent characteristics across studies further strengthen the evidence that digital educational media are an effective intervention strategy in anesthesia nursing practice.

Nevertheless, this study is not without limitations. First, the sample size of only 30 respondents is relatively small and may not be representative of the broader population of patients undergoing general anesthesia at Queen Latifa General Hospital, Yogyakarta. This limited sample size reduces the generalizability of the findings, necessitating caution in applying the results to larger populations. Second, the quasi-experimental design utilized a pretest–posttest format without a control group, introducing the possibility of bias and making it difficult to establish that changes in anxiety were solely attributable to the e-booklet intervention. Additional confounding factors, such as patients' prior medical experiences, individual anxiety predispositions, and family support, could not be fully controlled, although efforts were made to minimize these influences through strict inclusion criteria and initial interviews. Another limitation lies in the relatively short duration of data collection, which precluded measurement of the long-term effects of the intervention.

The instrument used, the APAIS questionnaire, while valid and reliable, remains susceptible to subjective bias since responses depend on patients' psychological states at the time of completion. This may lead to results that do not fully reflect actual anxiety levels. Moreover, certain aspects of preoperative anxiety may not be captured by the instrument, thereby limiting the comprehensiveness of the findings. Therefore, future research with stronger experimental designs, larger sample sizes, and more diverse measurement instruments is highly recommended. Such improvements would enable a more robust understanding of the effectiveness of digital educational media in reducing preoperative anxiety, while further strengthening the role of educational interventions in enhancing the quality of anesthesia care in hospital settings.

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CONCLUSION

Based on the findings and discussion regarding the influence of e-booklet-based education on the anxiety levels of patients undergoing general anesthesia in the preoperative room, it can be concluded that prior to the educational intervention, most respondents were categorized as having moderate anxiety, with 19 individuals (63.3%) and a mean score of 3.86. After receiving education through the e-booklet medium, there was a significant change, with the majority of respondents shifting to mild anxiety, totaling 28 individuals (93.7%) with a mean score of 5.00. These results were further supported by the Wilcoxon test analysis, which produced a p-value of 0.001 (<0.005), leading to the rejection of H0 and the acceptance of Ha. This indicates that e-booklet-based education has a significant effect in reducing the anxiety levels of patients undergoing general anesthesia in the preoperative setting.

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