

# The Effectiveness of Preoperative Nursing Visitation in Reducing the Level of Preoperative Anxiety and Postoperative Pain in Elective Surgery Patients: A Systematic Literature Review

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## ABSTRACT

Preoperative nursing visitation is a method used to prepare the patient's knowledge and psychology for surgery, in order to prevent preoperative anxiety and decrease postoperative pain as well as have a positive impact on the smooth running of the surgical process. The purpose of this research is to provide evidence regarding the effectiveness of preoperative nursing visitation in reducing preoperative anxiety and postoperative pain. This research use PubMed, Wiley Online Library, Cochrane Online Library, ProQuest, and Science Direct were investigated for experimental design studies on the effect of preoperative nursing visitation in reducing postoperative anxiety and pain in elective surgery patients. Three studies were identified and analyzed from 104 initial articles. Data were then extracted from the study and summarized descriptively. The conclusion Preoperative nursing visits can reduce anxiety levels and postoperative complications, especially postoperative pain and are highly recommended as a nursing protocol in routine care for surgical patients.

## I. Introduction

Anxiety is a psychological condition in the form of fear without a clear object being known, feelings of anxiety, worry and stress that can have a negative impact on one's health. Anxiety in patients who will undergo surgery is something that often occurs and even the anxiety experienced sometimes exceeds the fear of the patient's own illness. Preoperative patient anxiety caused by a surgical procedure which is a stressor that threatens the integrity of the patient's body and soul. The patient's anticipatory response to a surgical experience is considered a threat to the function and integrity of the body and role. The preoperative phase causes anxiety in most patients scheduled for surgery. The incidence of anxiety in the preoperative phase is around 11%-80%, depending on the type of surgery, the gender of the patient, and whether the patient is having surgery for the first time (Alvarez et al., 2020). Several meta-analytical studies obtained in the European region show that the prevalence of preoperative anxiety among surgical patients varies from 27% to 80% with the highest being observed in Spain and the lowest in the Netherlands. In India the prevalence of preoperative anxiety varies from 47% to 70.3% while the prevalence of preoperative anxiety in Pakistan ranges from 62% to 97%, in the United States it is shown that the prevalence of preoperative anxiety is as high as 20.2% while the prevalence of preoperative anxiety in Brazil is 24% (Abate et al., 2020). Looking at these data, the prevalence range of anxiety is from 11% to the highest of 97%. This value is quite high and convincing that anxiety is a preoperative patient problem that occurs massively in patients who will undergo surgery.



Anxiety in preoperative patients cannot be underestimated because anxiety is the beginning of the preoperative patient's physical problems. Anxiety causes several symptoms in the body, such as increased heart rate and breathing. This physical response within normal limits is important because it helps focus blood flow to the brain to prepare for an intense situation, but if excessive anxiety can cause patients to feel dizzy, nauseous and uncomfortable. This condition has an impact on the patient's hemodynamic changes that threaten the preparation for surgery and anesthesia. The results of meta-analytic literacy show that there are other negative effects of preoperative anxiety, namely acute myocardial infarction, heart failure, pulmonary edema, high hospitalization rates, poor quality of life, high rates of cardiac death which correlate with increased postoperative pain, increased consumption of analgesics and anesthetics, increase in hospital stay, adverse effects during anesthesia induction and patient recovery as well as decreased patient satisfaction with perioperative nursing (Abate et al., 2020).

The reasons that cause preoperative patient anxiety are usually patients who are afraid of pain after surgery, fear of physical changes for the worse, fear and anxiety of experiencing the same conditions as other people who have the same disease, fear and horror of the operating room, equipment, and staff. fear of dying while anesthetized and worried about the failure of the operation. Anxiety involves activation of different neural structures involved in emotional and cognitive processes in the central nervous system, subsequent activation in the autonomic nervous system, and the HPA axis. Areas in the CNS that are activated include the thalamus and limbic areas such as the amygdala and hippocampus. Direct projections from the thalamus to the amygdala are in response to noradrenergic stimulation from the locus cereleus. Indirect projections also stimulate the amygdala from the sensory and associative cortex. Meanwhile, the transitional cortex connects with the hippocampus. Then, the hippocampus transmits the stimulus to the amygdala's lateral nucleus, the hypothalamic paraventricular nucleus (PVN). PVN releases CRH to stimulate ACTH release in the pituitary which will be passed on to the adrenal cortex to finally secrete cortisol (Tafet et al., 2020). Excess cortisol has an impact on the emergence of anxiety, and cortisol levels are maintained in sufficient conditions to play a role in regulating the body's rhythm and must have a good balance.

Preoperative anxiety has actually been anticipated by providing nursing care by nurses in the operating room unit, but anxiety events still occur and recur. As if the care given was not optimal or even the patient did not respond to the care given. The solution offered is to carry out preoperative nursing visits by operating room nurses who will later follow and coordinate perioperative care for patients. This will be right on target because in the process of preoperative nursing visitation there will be education, introduction and patient assistance during the perioperative process. The process of comprehensive perioperative nursing care carried out by operating room nurses, namely circulation nurses, starts with education and orientation in the surgical care unit and in the operating room itself. Familiarizing patients with surgical procedures not only increases their awareness and knowledge, but also greatly helps in reducing the psychological stress caused by surgery (Bagheri et al., 2018). Education and guidance of preoperative patients by operating room nurses is considered the best method of meeting patient needs (Bagheri et al., 2018). In the process of education and guidance, patients will have the opportunity to express their worries and fears about the surgery they will be experiencing. The process of education and guidance will create a strong interpersonal relationship between the patient and the surgical nurse where the nursing care will focus on the patient's needs. In addition, in the process of education and guidance, they will be taught about postoperative pain management in the hope that patients are able to apply postoperative pain management so that they can reduce the pain they feel and prevent surgical complications.

The effectiveness of preoperative nursing visitation in preventing preoperative anxiety and postoperative pain can be seen from several research studies that have been conducted. Research by Sadati et.al (2012) reported that preoperative nursing visits can reduce preoperative anxiety levels and postoperative complications (Sadati et al., 2013). However, this study was limited to the female population and cases of laparoscopic cholecystectomy. Furthermore, another study by Aydal et.al (2022) reported that visitation of operating room nurses before laparoscopic surgery can be an effective method for reducing patient anxiety levels (Aydal et al., 2023).

This study still cannot prove the effect of preoperative nursing visitation on postoperative pain, besides that this study was conducted on patients with laparoscopic surgery. This study aims to review the effectiveness of preoperative nursing visitation as an additional provision of perioperative nursing care by operating room nurses to patients undergoing elective surgery, in a comparison of evidence regarding the effectiveness of preoperative nursing visitation in reducing preoperative anxiety and reducing postoperative pain..

## II. Methods

A comprehensive search was conducted July 6-12, 2023 in which we searched the PubMed, Wiley Online Library, Cochrane Online Library, ProQuest, and ScienceDirect databases, using keywords related to *surgical patient*, *preoperative nursing visit*, *preoperative anxiety* and *pain* without language limit.

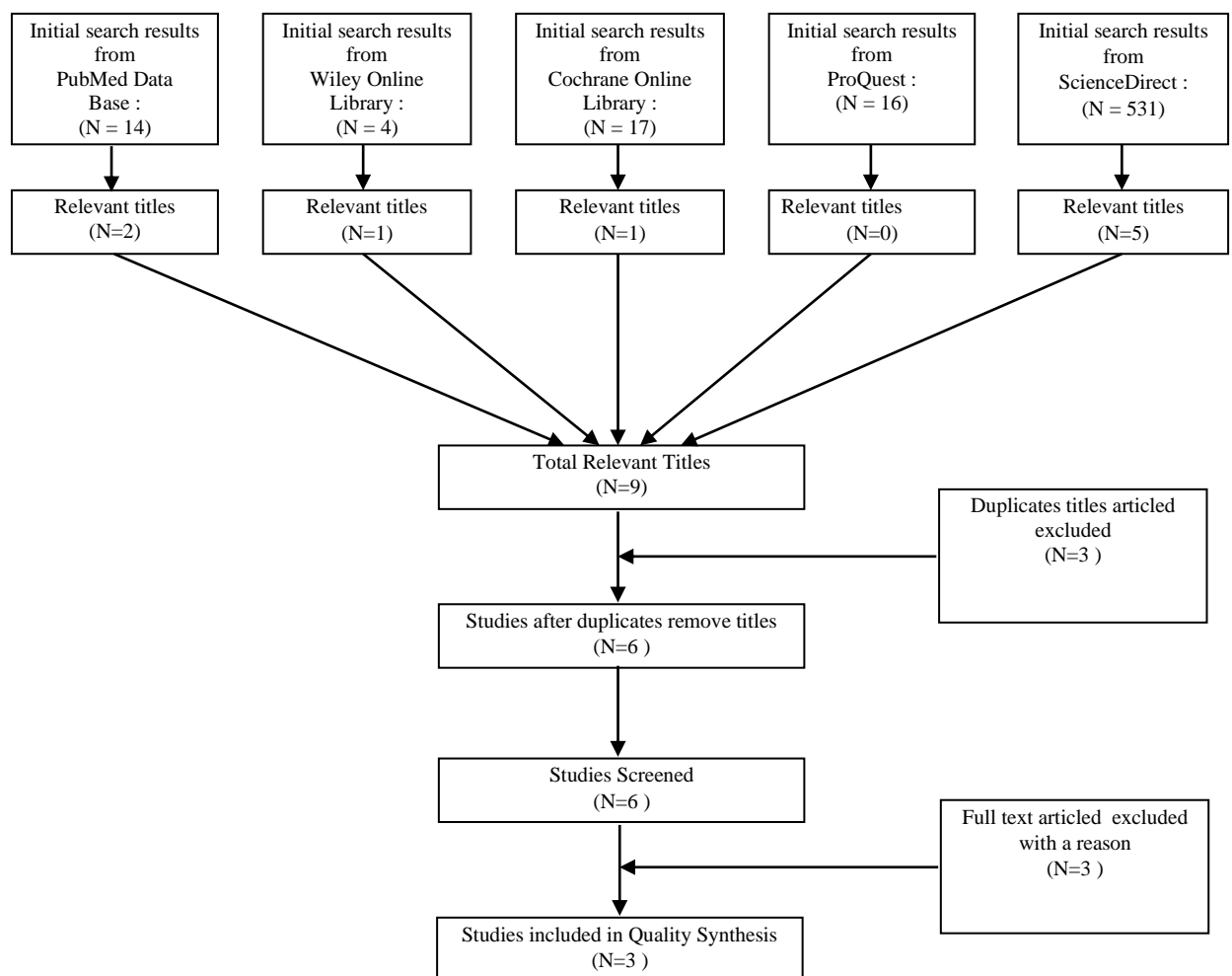


Figure 1. Flowchart for selecting articles

This study reviews evidence from any published experimental design studies between 2013 and 2023 to assess the effect of preoperative nursing visitation on preoperative anxiety and postoperative pain in patients undergoing elective surgery. Respondent inclusion and exclusion criteria in the manuscript were studies in male patients. Adult male and/or female, over 18 years of age, surgical plan is elective, Race and duration of follow-up are not considered.

Studies with relevant titles were then collected and screened. Studies found in more than one database were deleted. Complete manuscripts were then reviewed, and those that were irrelevant to the theme were excluded. Three studies were included in the systematic review

This systematic review was written based on guidelines *Preferred Reporting Items for Systematic Reviews and Meta-Analyses* (PRISMA) to report events evaluated by health care interventions and behaviors (Liberati et al., 2009). Question Population, intervention, control, and outcome (PICO) (Byronet et al., 2016) used in this systematic review were: P (population): *surgical patient*, I (intervention): *Preoperative nursing visit*, C (comparison/control): *Regular care by nurses in the surgical ward*. and O (result): *preoperative anxiety and pain*.

Statistical analysis, i.e. relevant information is taken and selected. Relevant information includes the type of research, patient characteristics, the interventions given, namely the effect of preoperative nursing visitation interventions, comparative interventions, and the methods used to analyze the research results. The main result assessed was the effectiveness of preoperative nursing visitation on preoperative anxiety and postoperative pain, classified as a decrease in anxiety scores compared to the control group. The author did not use a reference management program such as EndNote or Mendeley.

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### III. Results and Discussion

A search of the database find an initial 104 articles. (14 articles from the PubMed database, 4 articles from the Wiley Online Library, 17 articles from the Cochrane Online Library, 16 articles from the ProQuest database, and 531 articles from the Science Direct database. Due to irrelevant titles, 95 articles were excluded, and 3 articles were deleted due to title duplication. Then screening was carried out according to the specified eligibility, the result was that 1 article was excluded because it did not meet the criteria and 2 others were excluded because the article was not found and efforts to contact the author were unsuccessful. The title and abstract of the article were reviewed, and according to the results, only three met the criteria eligibility stated in this systematic review (Figure 1).

The first selected studies in this review were conducted in Türkiye (Aydal et al., 2023) and the second (Sadati et al., 2013) as well as third (Bagheri et al., 2019) done in Iran. In the first study there were 135 respondents (72 experimental groups and 63 control groups) (Aydal et al., 2023), the second study had 100 respondents (50 experimental groups, and 50 control groups) (Sadati et al., 2013), and in the third study there were 70 respondents (35 experimental groups and 35 control groups) (Bagheri et al., 2019). Measurement of preoperative anxiety data in the three studies was measured using *Spielberger State-Trait Anxiety Inventory*. In the first study (Aydal et al., 2023) Anxiety was measured before education and after providing education during preoperative nursing visits, and was measured after 24 hours of surgery. Meanwhile, pain was measured 24 hours after surgery. Second

study (Sadati et al., 2013) Preoperative and postoperative anxiety was measured and compared with the control group. Third study (Bagheri et al., 2019), preoperative anxiety was measured the night before going to the operating room and when the patient arrived at the surgery waiting room. Then the anxiety data was compared with the control group.

Measurement of postoperative pain data using VAS (Visual Analog Scale). VAS is used to evaluate pain intensity and shows the patient's pain in numbers (Aydal et al., 2023., Coll A, 2004). The scale requires patients to rate their pain as absent pain (starting at 0 [zero]) and unbearable pain (evaluated at more than 10 points). In the first study (Aydal et al., 2023) Postoperative pain measurements were carried out in the first postoperative hour (15, 30, 45 and 60 minutes), then the second 2 hours (every 30 minutes, namely 90, 120, 150, and 180 minutes), then after 4 hours of surgery (measured every hour, until 7 hours post-surgery), and finally after 7 hours pain was measured every 4 hours (11, 15, 19 to 24 hours). In the second study (Sadati et al., 2013), Postoperative pain was measured after 24 hours of surgery. For the second study, there were additional measurements of nausea and vomiting with the Johnson scale criteria. In the third study (Bagheri et al., 2019), there were no measurements of postoperative pain or nausea and vomiting. The systematic review shows that the first research design (Aydal et al., 2023) is *a single-center, randomized-controlled clinical trial*, the second research design (Sadati et al., 2013) use *prospective, semi-experimental, randomized clinical trial* and the third research or study using quasi-experiments (Bagheri et al., 2019). The first study was conducted in 2019 (Aydal et al., 2023) second study (Sadati et al., 2013) in February 2010 and January 2011, and the third study (Bagheri et al., 2019) in 2018.

Characteristics of respondents from the three studies were aged 18 years and over, able to communicate, and underwent general elective laparoscopic surgery, laparoscopic cholecystectomy, and herniotomy surgery.

Aydal et.al (2023) found that the score is the average score *State Anxiety Inventory* preoperative patients before education was 44.11 (moderate anxiety), after education 40.61 (moderate anxiety) and 31.16 (mild anxiety) after surgery. Average *Trait Anxiety Score* in pre-education was 34.25 in the experimental group and 34.86 in the control group. This showed no significance or no difference between the two groups ( $P > 0.05$ ). Prior to patient education, the anxiety score (*State Anxiety*) mean was 43.14 (moderate anxiety) in the experimental group and 45.22 (moderate anxiety) in the control group. There was no statistically significant difference between groups ( $P > 0.05$ ). After patient education, the average score of anxiety states was 38.12 (mild anxiety) in the experimental group and 43.44 (moderate anxiety) in the control group. Post-education scores (post preoperative nursing visitation/experimental group) were statistically lower ( $P < .001$ ). In his evaluation 24 hours after surgery, the average anxiety score was 30.39 (mild anxiety) in the experimental group and 32.03 (mild anxiety) in the control group. There was no significant difference between the two groups ( $P > 0.05$ ). In addition, there was no statistically significant difference between the experimental group and the control group in terms of postoperative pain levels ( $P > 0.05$ ).

In Sadati et.al's research (Sadati et al., 2013), found score *State and Trait Anxiety*, on admission to the surgical ward was 56.98, and 55.58 in the experimental group. In the control group, it was 56.1 and 55. There was no significant difference ( $p > 0.05$ ) between the two groups. However, after the preoperative nursing visitation and just before entering the operating room, the score decreased *state and trait anxiety* to 40.34 and 39.04 in the

experimental group, 56.70 and 55.38 in the control group. This shows that there is a significant difference between the experimental group and the control group ( $p < 0.05$ ). In addition, it was found that the average time to achieve an Aldrete 9 awareness score was 18 minutes in the experimental group and 30 minutes in the control group with significance ( $p < 0.05$ ). It was also found that only 6% experienced postoperative nausea and vomiting in the experimental group and 20% in the control group ( $p < 0.05$ ). Duration of stabilization of vital signs, postoperative pain, nausea and vomiting, and time to recovery from walking the first time patients were significantly shorter in the experimental group compared to the control group. ( $p < 0.05$ ).

Table 1 . Summary of data description from the included studies

Study	Subject criteria and study design	Intervention	Outcome
Aydal, et.al.2023 (Turkey) (Aydal et al., 2023).			
	<b>Subject criteria :</b> Patients who were 18 years old and above, were able to communicate, and were undergoing laparoscopic general surgery (such as laparoscopic cholecystectomy, colon resection, inguinal hernia, appendectomy, incisional hernia, and sleeve gastrectomy) were included in the study. Emergency and unplanned cases, patients transferred to the intensive care unit after surgery, and patients with neurological or psychological problems were excluded from the research.	<b>Experimental</b> Operating Room Nurse (Nursing Visit) Group (n = 63): Nursing visits were made by the operating room nurse. Information about the surgery in a process that lasted 20 to 30 minutes.	Pre-education State Anxiety Scale Score Min-Max: 21-67, Mean: 44.11, SD 8.75 Posteducation State Anxiety Scale Score Min-Max: 20-63 Mean:40.61, SD : 8.29 Postoperative State Anxiety Scale Score Min-Max: 20-54 Mean:31.16, SD: 6.39
	<b>Study design</b> A single-center, randomized-controlled clinical trial	<b>Control</b> Service Nurse Group (n = 72): After obtaining the patient's consent, the STAI was administered to the patient admitted to the surgical service, which lasted 20 to 30 minutes	Trait Anxiety Scale Score Min-Max: 21-53 Mean: 34.53 SD: 6.87 Post-education - Pre-education, $p = 0,001$ Postoperative - Pre-education, $p = 0,778$ Postoperative - Posteducation, $p = 0,011$

Study	Subject criteria and	Intervention	Outcome
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## study design

Sadati et.al. 2013 (Iran) (Sadati et al., 2013)

### Subject criteria :

Patients who were candidates for laparoscopic cholecystectomy. Candidates for inclusion were elective laparoscopic cholecystectomy patients between 18 and 60 years of age. Patients with underlying physical or psychological disease, with a history of past surgery or who had taken a particular drug, were excluded from the study.

### Study design

prospective, semi-experimental, randomized clinical trial

### Experimental

A preoperative nursing visit was conducted for each patient in the intervention group on the day before surgery. (n=50). patient given information and education about the operating room, anaesthesia, surgical procedures, and pre-and postoperative care.

### Control

Service Nurse Group (n=50)

State anxiety in admission (experiment: 56.98) (control:56.1), p= 0.2

Trait anxiety in admission (experiment: 55.58), (control: 55), p= 0.4

State anxiety prior to OR entrance (experiment:40.34), (control: 56.7), p= 0.0

Trait anxiety prior to OR entrance (experiment: 39.04), (control: 55.38), p= 0.0

Postoperative pain (VAS) (experiment:5.1), (control: 5.7 ), p=0.001

Bagheri, et.al. 2019 (Iran) (Bagheri et al., 2019)

The inclusion criteria were hospitalization for elective ventral hernia repair (inguinal [direct and indirect], femoral, and umbilical hernia), age group of 15–65 years, and could speak Persian. Patients with previous history of surgery conducted in an operating room, psychiatric disorders, dependence on antidepressants and analgesics, and those who were members of the medical or paramedical profession were excluded.

### Study design

An interventional study with a quasi-experimental design.

### Experimental

(n=35) Patients given information about the surgeon, type of surgery, place of surgery, time of surgery, duration of surgery, operating room setting, and duration of postanesthesia care unit stay using simple and understandable language. Intervention group were also reassured that the researcher (surgical technologist) would be present in the operating room on

State anxiety Preintervention : Control Grup : 48.6,SD: 9.7

Intervention Grup : 45.6 SD: 9

Postintervention Control Grup : 50.9 SD: 10.7

Intervention Grup : 42.3, SD: 9.2

P = <0,05

### Trait anxiety

Preintervention : Control Grup : 50.9 SD: 9.3

Intervention Grup : 45.1 SD: 11.1

Postintervention: Control Grup : 51.8 SD: 9.4

Intervention Grup :43.3

the day of surgery. SD: 10.4  
Control P = <0,05

(n=35) The control group did not receive the intervention of study and received only routine preoperative care by nurses in the surgical ward and operating room department

In the study by Bagheri et.al., (2019) it was found that the average score of preoperative state and anxiety trait in all subjects was 47.1 in the experimental group and 48.6 in the control group. Most of the subjects were in the category of state anxiety (44.3%) and trait anxiety (38.6%).

The average anxiety score decreased significantly in the experimental group after the perioperative nursing visitation, while the score increased significantly in the control group. The results of the paired T-test also confirmed a significant difference in the mean anxiety scores before and after the experiment (P, 0 ,05). The independent t-test showed differences in the average anxiety scores between the experimental group and the control group.

Based on the results of the analysis of the three studies above, there is a significant effect of preoperative nursing visitation on preoperative anxiety. However, not all of these studies have a significant effect of preoperative nursing visitation on postoperative pain. Of the three studies above, only one study had evidence of the effect of preoperative visitation on postoperative pain, one study was not significant and one did not measure postoperative pain.

Anxiety is a subjective experience for individuals and emotional states without a specific object and is caused by unknown things or new experiences such as going to school, starting a new job, or giving birth (Stuart, 2013).

Nursing Diagnosis Anxiety according to NANDA International is anxiety as a feeling of fear caused by anticipation of danger. Anxiety causes different resources to be deployed (attention, perception, memory, motor activity, etc.) to deal with this threat. However, anxiety is also the origin of processes that can lead to illness. When high levels of anxiety are maintained for long periods of time, it can have an impact on psychological and physiological well-being, and can even affect the defenses of the immune system (Luengo et al., 2023). Anxiety according to the Diagnostic and Statistical Manual of Mental Disorder (DSM) can be classified into Generalized Anxiety Disorder (GAD), panic disorder, agoraphobia, specific phobia, social anxiety disorder, selective mutism, separation anxiety disorder, anxiety disorder due to other medical conditions, other specified anxiety disorders and unspecified anxiety disorders <sup>(16)</sup>. Perioperative anxiety causes stress, as for most patients entering the operating room is a frightening experience. Furthermore, preoperative experience and unconsciousness during anesthesia are highly anxiety-provoking factors (Yu and Hou, 2023). Surgical patients can experience high levels of anxiety upon admission to the hospital and at the start of surgery. Existing fears, such as: fear of the unknown, fear of pain, and fear of losing one's life, can put surgical patients in a very stressful preoperative situation. During preoperative waiting times patients often feel abandoned by staff, or unable to, provide adequate psychological support to patients (Li et al., 2021). Surgical events are a stressor for



patients who will undergo them. Worries about the integrity of health, fear of the action that will be faced and the new environment is experienced by almost every surgical patient. Preoperative anxiety is not only a psychological threat, but more than that, namely preoperative anxiety threatens the patient's physical status. We all know how a person who is about to undergo surgery must have a vital and hemodynamic status within normal limits so that surgical and anesthetic complications can be reduced. Therefore, preoperative anxiety should be of particular concern to nurses, especially operating room nurses who are perioperative care providers. The decision of surgery as a treatment in the patient causes physiological responses to stress and surgical trauma including the secretion of cortisol, catecholamine's, cytokines, antidiuretic hormone, and glucagon (Coll A, 2004). The study of anxiety disorders is mostly related to Gamma Aminobutyric Acid (GABA) and the serotonergic system (Ramazali., 2019, Nuss et al., 2015., Farach FJ, et al., 2012) Gamma aminobutyric acid is an inhibitory neurotransmitter in the Central Nervous System (CNS) and has a role to maintain homeostasis by balancing nervous excitability (Ramazali., 2019., Mohler H.. 2012). According to Goddard in 2016, GABA was found to play a role in the pathogenesis of anxiety and stress. Abnormal GABA state can be a mediator of neuropsychiatric diseases such as anxiety (Ramazali., 2019., Goddard AW., 2016). Several metabolic and physiological responses to surgery lead to imbalances in essential physiological functions. At the same time, delayed effects of anesthetic and muscle relaxant. This weakens the body's natural ability to rebuild the patient's homeostatic status and maintain the patient's health, resulting in delays in post-anesthesia recovery and post-operative complications in the post-anesthesia care unit (Coll A, 2004).

The solution to reducing preoperative anxiety and reducing postoperative pain is to conduct preoperative nursing visits by competent operating room nurses. In the visitation activities of nurses to the operating room include providing education, psychological assistance and guidance, orientation and there are therapeutic interactions that can provide a sense of comfort to patients. Preoperative nursing visitation is one of the safest and most effective methods (Price B, Price P., 2007., Sadati et al., 2013) To provide psychological support and education to patients. These visits provide an opportunity to collect data for better patient management during surgery and to educate patients about working closely with the surgical team and their medical care. Informed surgical patients experience less fear and anxiety (Smeltzer and Suddarth's., 2010., Sadati et al., 2013). As reported by Kiyohara et al.(2004) (Sadati et al., 2013), preparation of intensive visits by anesthesiologists and providing better patient education can significantly reduce anxiety in patients. Better fluidity of surgical procedures and earlier patient independence means that nursing care is now more focused on psychological care and anxiety management, which are the cornerstones of nursing care in patient surgery (Pritchard MJ., 2009., Sadati et al., 2013).

The positive effect of preoperative nursing visitation on surgical patients in reducing preoperative anxiety and reducing postoperative pain can occur if during the visitation the components of education, counseling, assurance of a sense of comfort and safety and positive interaction between operating room nurses and patients are carried out properly. This study by Zhuo et.al (2020) provides evidence that pre-operative education tailored to the patient's information-seeking style effectively reduces pre-operative anxiety and depression and increases satisfaction. In this study, pre-operative education was compared with conventional pre-operative education. Therefore, preoperative education must be adapted to the style of information seeking (Zhuo et al., 2023). Study of the effect of preoperative nursing visitation

on preoperative anxiety and postoperative pain shows that preoperative nursing visitation has an impact on reducing preoperative anxiety. According to research conducted by Valenzuela-Millan et al. (Valenzuela and Aguirre, 2010., Sadati et al., 2013) in 135 patients, 76% of them were anxious before surgery, and the most important aggravating factor was lack of information. Elsewhere the study conducted by Kiyohara (Kiyohara, et al., 2004., Sadati et al., 2013), preoperative nursing visits by anesthesiologists and the existence of an adequate patient education process significantly reduced anxiety in the patients studied.

Studies show that preoperative nursing visits can reduce preoperative anxiety levels and postoperative complications, one of which is postoperative pain (Sadati et al., 2013).

#### IV. Conclusion

Our study shows that preoperative nursing visits can reduce the level of anxiety and postoperative complications, especially postoperative pain and must be part of the nursing protocol in the routine care of surgical patients.

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